



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

### Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

### About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>

HEALTHY MORAL HOMES.  
3/-



25







25













DOUBLE 6 ROOMED COTTAGE.  
TO COST £80.



SINGLE 6 ROOMED COTTAGE.  
TO COST £40.

# HEALTHY MORAL HOMES

FOR

AGRICULTURAL LABOURERS.

SHOWING

A "GOOD INVESTMENT" FOR LANDLORDS, WITH GREAT  
ADVANTAGE TO TENANTS.

By C. VINCENT BERNARD,

A "Practical Workman" of Forty Years' Experience.

---

"HEALTHY MORAL HOMES" PRODUCE WELL FORMED AND WELL MINDED  
"WOMEN AND MEN."

---

WITH 24 ILLUSTRATIONS.

LONDON:  
JAMES RIDGWAY, PICCADILLY.  
1860.

173. f. 10.


LONDON :  
BRADBURY AND EVANS, PRINTERS, WHITEFRIARS.



TO THE  
LANDLORDS, OWNERS OF AGRICULTURAL PROPERTY

AND TO THE  
TENANTS WORKING AS AGRICULTURAL LABOURERS UPON  
SUCH PROPERTIES :

THIS WORK IS SUBMITTED WITH GREAT RESPECT AND THE REMARKS  
ON RECIPROCAL DUTIES HUMBLY RECOMMENDED TO THE CAREFUL  
CONSIDERATION OF BOTH LANDLORD AND TENANT.





## P R E F A C E.

---

THE writer has for the last forty years, in season and out of season, strongly urged the vast importance of the necessity for improving the "Homes" of the Agricultural Labourer.

This great fact is acknowledged by all to be absolutely necessary to stop the demoralising tendencies produced by the want of "Healthy Moral Homes."

This book, he trusts, will assist to that effect by its plain homely truths, endeavouring to produce in their formation "solid utility" with such comforts, rendering the labourer's cottage what it should be—a "Home."

The Introduction will repay a careful perusal, showing the opinions a century back justly entertained by that good man, the great "Philanthropist Howard;" also, since his time, by T. W. Coke, Esq., of Holkham; the Duke of Bedford; the present Earl of Leicester; Lords Palmerston and Kinnaird; with many other well-disposed men, such as the late Mr. Loudon (to whom architects and the country owe a debt of gratitude); also E. Chadwick, Esq.;

Dr. Southwood Smith ; the Editors of the " Art Union," " Builder," " Building News," and " Engineer ;" Miss Martineau ; and to George Glenny, Esq., the Agricultural Labourers' constant and best " garden friend."

The Plates will explain themselves, although the letterpress description and specific details must be examined with care. The writer believes that, in most counties of Great Britain, the average cost will be the same.

Sincerely trusting such " Homes " may be the " rule " in all our agricultural parishes, and not the exception, is the desire of a " Practical Workman."

A few pages are devoted under the head of "*Handy Hints*" useful to know, and for occasional reference on matters to all connected in cottage buildings and gardens, showing the advantages of a "Stitch in time Saving nine ;" also, the *Profitable Duty* of "Waste not Want not," and its great importance by strongly inculcating the positive necessity of "a place for everything, and everything in its place ;" the advantages of "*Savings Banks*," and the disadvantages of "*Smoking*."

## CONTENTS.

---

PLATE	PAGE
I.—Improved double Scotch cottage, 1806, containing each one room and closet. Cost 30 <i>l</i> . . . . .	13
II.—Improved single Scotch cottage, 1858, containing entrance lobby, kitchen, scullery, and two bed-rooms. Probable cost 140 <i>l</i> . . . . .	14
III.—Royal Agricultural Society's Prize Essay Cottage, 1843; double cottage, containing keeping-room, pantry, and two bed-rooms. Cost of the two cottages 120 <i>l</i> . . . . .	16
IV.—Three room cottage; accommodation, two porches, living-room, scullery, pantry, and bed-room. Cost 30 <i>l</i> . . . . .	42
V.—Double four room cottage, each containing two porches, lobby, living-room, scullery, pantry, and two bed-rooms. Cost 37 <i>l</i> . 6 <i>s</i> . 8 <i>d</i> . each . . . . .	44
VI.—Double cottage of four rooms each. Accommodation; porch, two lobbies, living-room, kitchen, pantry, stairs, and two bed-rooms. Cost 38 <i>l</i> . 1 <i>s</i> . 6 <i>d</i> . each . . . . .	46
VII.—Five room cottage; two porches, living-room, scullery, pantry, three bed-rooms, "nécessaire," apiary, tool place, &c. Cost 42 <i>l</i> . 5 <i>s</i> . 10 <i>d</i> . . . . .	48
VIII.—Five room cottage; contains porch, lobby, living-room, scullery, pantry, three bedrooms, &c. Cost 44 <i>l</i> . 11 <i>s</i> . 5 <i>d</i> . . . . .	51
IX., X.—Double five room cottage, each containing two porches, lobby, living-room, scullery, pantry, stairs, and three bedrooms. Cost 36 <i>l</i> . 14 <i>s</i> . 9 <i>d</i> . each . . . . .	52—53
XI.—Six room cottage, containing porch, lobby, living-rooms, pantry, scullery, stairs, and three bed-rooms. Cost 49 <i>l</i> . 4 <i>s</i> . 3 <i>d</i> . . . . .	54
XII.—Details of brick walls built hollow . . . . .	62



PLATE	PAGE
XIII.—Details showing the construction of “pise” or earth walls . . . . .	66
XIV.—Details showing doors and frames, also windows . . .	77
XV., XVI.—Double six room cottages, each containing two porches, lobby, living-rooms, kitchen, dairy, stairs, and three bed-rooms. Cost 43 <i>l.</i> 10 <i>s.</i> each . . .	78—79
XVII.—Six room cottage, containing two porches, lobby, living-room, kitchen, dairy, stairs, and three bed-rooms. Cost 50 <i>l.</i> 10 <i>s.</i> 11 <i>d.</i> . . . . .	80
XVIII., XIX.—Double five room cottage, each containing two porches, lobby, living-room, dairy, stairs, and three bed-rooms. Cost each 50 <i>l.</i> 7 <i>s.</i> 10 <i>d.</i> . . . . .	82
XX., XXI.—Five room cottage, containing two porches, lobby, living-room, kitchen, stairs, and three bed-rooms. Cost 50 <i>l.</i> 17 <i>s.</i> 1 <i>d.</i> . . . . .	84
XXII.—Details of plans of chimneys to Plates VII., VIII., and XVII. . . . .	92
XXIII.—Details of plans of “nécessaire,” manure tank, pig-stye, &c. . . . .	94

We can provide working plans, elevations, and sections, with detail drawings and specifications, at a very moderate agreed price. Parties forwarding the local price of materials and labour, correct estimates of cost will be sent.

Practical advice given on all matters connected with buildings of every description, by application to C. V. BERNARD, No. 2, Lucas Place, Commercial Road East, London.

## HEALTHY MORAL HOMES.

---

### AGRICULTURAL LABOURERS' COTTAGES

Is a subject to which, for some years, we have given much earnest attention, being well assured, that unless the cost be made to yield a fair interest, well constructed Moral Homes would continue the *exception* and not the *rule*.

Taking it for granted that the desire to encourage the erection of cottages with due regard to the comforts of *Light, Space, Warmth, Ventilation*, and freedom from *Damp*, is made to coincide with a fair interest on Capital expended, it may be held as a first principle, that every exertion should be made to devise such plans as will enable proprietors to erect the necessary accommodation at such a moderate expenditure that a labourer earning the ordinary rate of wages can, without difficulty, pay a fair interest for the outlay in the shape of rent. On no other principle can the improvement of our cottages become general; on any other, an artificial stimulus may be given, but it can neither be extensive nor permanent.

Hence none of the various Model cottages have been extensively carried out, their cost being such, that few

labourers could afford to pay the required rent to allow a fair per-centage, consequently they fall into the *exceptional* class.

Architects find no great difficulty in providing neat and pretty plans, with plenty of accommodation, provided always no limit be put to the expenditure. But this is not all that is required; the plan may be most tasteful, with superabundant accommodation, and still the dwelling be damp, smoky, uncomfortable, and unhealthy. Proprietors, however, in general will not consent to erect such costly buildings, nor is it necessary for the good of their cottagers that they should do so. Before the elegant dwelling can be suitably occupied and enjoyed, there must be a gradual training by the possession of *well-arranged, well-aired, well-lighted, well-drained*, wholesome, though plain buildings.

The most glaring defect of the greater number of the cottages is their dampness, to which may fairly be attributed the great prevalence of rheumatic affection among the rural labourers, by which many of them are disabled from doing a good day's work long before their natural strength ought to fail through old age. There can be no more effectual mode of inducing rheumatism than to return heated after a hard day's work, and spend the night in a damp chilly bed; and the public loss from this cause is not small.

Many a respectable and industrious man thus becomes a burthen on his family or his parish, at an age when he ought to be perfectly able to maintain himself.

Damp gets into a house from three quarters—from the *floor*, from the *roof*, and from the *walls*.

The attention of landed proprietors has often been directed to the necessity for the improvement of labourers' cottages,

and in not a few instances the entire aspect of a village and neighbourhood has in this respect been completely changed by the well directed efforts of a single landlord.

Illustrations might be drawn from the examples set by many noble and wealthy proprietors. As one of the earliest cases which show how, with comparatively limited means, much good may in this way be effected, it is recorded of John Howard, the celebrated Prison Philanthropist, that when he first went to reside at Cardington in Bedfordshire, about 1756, he found it one of the most miserable villages which could have been pointed out on the map of England. Its peasant inhabitants were wretchedly poor, *ignorant, vicious, turbulent, dirty*, etc.

With his characteristic energy and earnestness, Howard set himself, within the sphere of his own competence and influence, to ameliorate their condition, both in a worldly and spiritual sense.

Beginning with his own estate, he saw that the huts in which his tenantry, like all others of their class, were huddled together, were dirty, ill-built, ill-drained, and imperfectly lighted and watered, and altogether so badly conditioned and unhealthy as to be totally unfit for the residence of human beings. He resolved to begin his work at the true starting-point, by first aiming to improve their physical condition, to supply them with the means of comfort, attaching them thus to their own firesides, the great centre of all pure feeling and sound *morals*—to foster and develope in them a relish for simple domestic enjoyments.

His first step in furtherance of these objects was obviously a wise one, that of rendering the homes of the poor, dwellings fit for *self-respecting* men.

This must indeed be the starting-point of every true social and industrial reformation. In carrying his plan into effect, Howard does not seem to have troubled himself much about that paramount question, the per-centage; though an arithmetician and a man of business, he considered that his wealth was merely held in trust for the benefit of mankind, and consequently he had no hesitation in investing it with a view to returns rather in the shape of *order*, *virtue*, *intelligence*, and *happiness*, than in money.

Having decided that the miserable mud huts in which he found his cottagers living, should be taken down, he carefully selected some good and convenient plots of ground, on which he caused a number of very superior cottages to be built, and transferred into them such persons as he most strongly approved of for tenants; his absolute requirements were—habits of *industry*, *temperance*, and *observance* of the *Sabbath*. The doctrinal opinion of his tenants he did not interfere with.

How refreshing it is to find such conduct, and what advantage to the agricultural labourers, had it been at that period the *rule* of the Landed Proprietors instead of the *exception*.

Homes are the manufactories of men, and influence a growing nation. The importance of improving these homes is at once seen; *perfect men* come not forth from *ill-arranged*, *ill-ventilated*, *ill-ordered* dwellings.

Cottage building, writes the Duke of Bedford, except to a cottage speculator who exacts immoderate rents for scanty and defective habitations, is, we all know, a bad investment of money; but this is not the light in which such a subject should be viewed by landlords, from whom it is surely not

too much to expect, that while they are building and improving farm-houses, homesteads, and cattle-sheds, they will also build and improve dwellings for their labourers, in sufficient number to meet the improved and improving cultivation of the land. To improve the dwellings of the labouring class, and afford them the means of greater *cleanliness, health, and comfort* in their own homes; to extend *education*, and thus raise the social and moral habits of those most *valuable members* of the community, are among the *first duties*, and ought to be among the *truest pleasures*, of every landlord. While he thus cares for those whom Providence has committed to his charge, he will teach them, that reliance on the exertion of the faculties with which they are endowed, is the surest way to their own independence and the well-being of their families.

I shall not dwell, as I might, on the undeniable advantage of making the rural population contented with their condition, and of promoting that mutual good-will between the landed proprietor and the tenants and labourers on his estate, which sound policy and the higher motives of humanity alike recommend.

Quaint Old Fuller, in his "Holy State," says, "In Building we must respect Situation, Contrivance, Receipt, Strength, and Beauty of Situation, *chiefly choose a wholesome aire*, for aire is a dish one feeds on every minute, and therefore it need be good. Water is a staple commodity. Next a pleasant prospect is to be respected. A fair entrance with an easie ascent gives a great grace to a building. *Let not thy common rooms be severall, nor thy severall rooms be common.* The Hall ought to lie open, and so ought passages and stairs. Chambers and Closets are to be private and

retired. *Light (God's eldest daughter) is a principal beauty in a building; yet it shines not alike from all parts of Heaven. An East window welcomes the infant beams of the Sun, before they are of strength to do any harm, and is offensive to none but a sluggard. A South window in summer is a chimney with a fire in't, and needs the schreen of a curtain. In a West window, in summer time towards night, the Sun grows low and over familiar with more light than delight. A North window is best for Butteries and Cellars. Country houses must be Substantives, able to stand of themselves. Beauty remains behind as the last to be regarded, because houses are made to be lived in, not lookt on. Let not the Front look asquint on a stranger, but accost him right at his entrance. Uniformity also much pleaseth the eye; and 'tis observed that freestone, like a fair complexion, soonest waxeth old, whilst brick keep her beauty longest. Gardens also are to attend in their place. When God planted a garden Eastward, he made to grow out of the ground every tree pleasant to the sight, and good for food."*

The most humble abodes in order to be healthy must be dry and well ventilated; to secure the former it is essential that due attention be given to the locality, as respects its capability for efficient drainage, dryness, and general healthiness. The vicinity to good water is of obvious importance. A gravelly soil is always preferable to clay, and a low situation is seldom healthy.

It is desirable that every cottage should stand in its own inclosed garden of not less than about one-eighth of an acre, with a separate entrance from the public road, and about seven yards from it. The cottage should be so placed that

the sun may shine on the most frequently inhabited sides of it throughout the year. It should, therefore, in this country, face the N.E., S.W., N.W., or S.E.

One well may generally be made to answer for two or more cottages.

The various designs in this book provide the following accommodation on the ground-floor :—front porch, entrance lobby and stairs, living-room, scullery, pantry, coal-cellar, and back porch. On chamber-floor: three bed-rooms, so arranged as to have separate entrances from the stairs, on landing; and great attention has been given to place the parents' bed-room as *distinct* from the others as possible.

Lord Kinnaird says—"I most strongly advocate the adoption of separate sleeping apartments, as much of the immorality in Scotland, I am convinced, arises from the habit of parents and children, brothers and sisters, lodgers and visitors, sleeping in the same rooms, and even occasionally in the same bed—a custom which must destroy all sense of decency and decorum."

Though young persons are necessarily taken very early to agricultural labour, a portion of their spare time in the evening will be beneficially and agreeably spent in mental improvement. Some volunteer qualified to give instruction in the fundamental branches will often be found, where a *decent* place of meeting is also provided.

A desk, with shelf under and over, should be provided as a fixture in all living-rooms.

A sober, industrious, and cleanly couple will impart an air of decency and respectability to the poorest dwelling. Habits of industry, economy, order, and cleanliness will do



much to remedy existing evils, and to render the most humble cottage an abode of domestic peace and happiness.

The children of a labourer rarely remain at home after they are fourteen or fifteen ; but the separation of the sexes in their sleeping apartment is quite as proper for them as for the landlord's sons and daughters.

The girls' bed-room is larger than the boys' bed-room, so as to be occasionally used as a work-room for the girls.

Every cottage should possess the convenience of a scullery or back-kitchen, so that it may not be a matter of necessity that the perpetually recurring washing, with its accompaniment of damp and steam, should take place in the presence of the assembled family.

Foundations to be laid on a dry soil. If a clay soil, put a bed of concrete six inches in height and six inches wider each way than the thickness of the wall. On this place the brick footings ; and in all cases, at six inches above the surface of the ground, place a layer of thick gas-tar mixed with coarse sand, or two courses of slate over the horizontal surface of all the walls.

The walls to be so constructed as to completely exclude wind and rain.

The ground-floor should be raised at least one foot above the ordinary level of the ground, contributing most effectually to the dryness of the house.

The height of rooms to be at least seven feet six inches from floor to ceiling.

It is desirable that the front entrances should be at each end, keeping the two families separate.

All the doors on the ground-floor to be not less than six

feet six inches high ; those to the bed-rooms six feet four inches.

All the windows to be at least four feet high, and of good width, to slide. Casements on friction-rollers—bottom and top. The medical profession complain, and apparently with great justice, of the evils resulting from the draughts of sashes hung to work up and down, as when the lower sash is open the draught strikes the chest, and the top sash down, the draught strikes the head. As an established fact, many pulmonary complaints arise from sitting against windows thus open ; and the oft-repeated inconvenience of opening the top sash, at times the most important one to open for good and efficient ventilation, is severely felt even in first-rate houses, and much more so in cottages ; and a broken line to a hanging-sash causes much trouble to reinstate. This, in cottage building, is remedied by the adoption of sliding-casements. The slightest distance moved creates ventilation by the flow of air the whole height of sash.

A projecting roof is of great importance ; besides protecting the walls, it at all times gives a certain style to even a very humble dwelling.

A porch adds effect to the building, and aids greatly to the interior warmth of the cottage.

The floors to pantry and coal-cellar to be level with the footings to main walls. A brick bench should be placed in all pantries as a useful appendage.

A sink should be placed in the scullery, through which slops of every description can pass through a trapped stoneware or iron sink (stoneware, as the most cleanly, preferred) to a trapped stoneware drain to the manure tank (a most indispensable requisite to the cultivation of a garden).

Nothing will contribute so much to cleanliness in the house and at the door as for the wife to find that it is less trouble to deposit the slops in the sink than to carry them to the door.

The manure-tank, to be placed at least thirty feet at the rear of the house, to contain about two hundred gallons—say, about four feet by two feet and four feet deep. Form in the tank a well twelve inches deep and sixteen inches square, with a man-hole level with the surface of the ground to dip out the liquid as may be required. Over the tank form the ash-bin. Acting as the back-wall to the *necessaire*, the excreta will fall into the tank by a four-inch drain-pipe, to finish within four inches of the bottom of the well; thus preventing the escape of the gas into the *necessaire*. Adjoining the *necessaire* could be placed the pigstye, with a drain to well in tank. A man's stoneware watering-sink should always be provided, to drain also into the tank. The tank will thus receive from these four sources of supply such a fertilising material, if properly mixed as to quality, and applied with judgment, as would quadruple the produce from the garden. See Plate XXIII., p. 94.

A wattle-screen, for the sake of decency, should be placed four feet from front of pig-stye, &c., about six feet in height, against which could be planted evergreen ivy.

Surface and rain-water drainage on no account to be connected with the manure tank.

Warming and ventilating, upon a simple plan, is of the utmost importance. Form a drain for external air to communicate with an air-chamber formed at the back of the range to living-room, with an outlet regulating valve into the entrance-lobby. This will give warmth to the lobby

stairs and bed-rooms. Place over the bed-room doors finely-perforated zinc panels ; also the same in the ceiling to each bed-room, communicating with the space between ceiling and roof. A ventilating air-flue is carried up in the centre of the chimney stack ; by its contiguity to the smoke-flues in use, the warmth from that source will always insure a draught. It delivers itself under the projecting brick courses of chimney. Air-grates are placed in roof space, just under the ridge, into this flue ; air-pipes to be placed at the back of each fire-place, as feeders from the external air. The sliding casement, as before stated, in all instances becomes, upon the very slightest opening, a first-class ventilator.

Eaves'-gutters to the roofs, with down-pipes, should always be fixed to communicate with a tank. Where water is difficult to obtain, the preservation of the water to the occupant of the cottage is of great value. The tank to contain about three hundred and fifty gallons, with a well in ditto, formed sixteen inches square and twelve inches below the floor of tank, either to bale out the water from the man-hole, or for a suction-pipe to a pump. At a trifling cost, a filter could be placed in the tank, thus providing at all times a clear, sweet beverage.

Beadon's patent imperishable eaves' gutter-tiles are far superior to any other mode of conveying water along the eaves to the down-pipes.

It is desirable to render the house as fire-proof as possible. The stairs to be either slate, stone, or "terra cotta" (stone-ware)—the last most preferred for cleanliness, durability and cost. The floors to the bed-rooms and landings, of plaster ; and whatever walls are plastered (very unnecessary, as walls limewhited are more conducive to health) to have

narrow skirtings in cement round all the rooms. The ground-floor to be composed of powdered stone, lime, sharp sand, and furnace-dust, laid upon a substratum of road-metal. The partitions to all the rooms of hollow bricks—on no account to have lath partitions.

The fittings to a labourer's cottage should be—To the entrance-lobby: a rail, with strong iron surplice-hooks, also surplice-hooks to back of door; a ventilating grate from hot-air chamber. In living-room: Nicholson's (of Newark) cottage-range, with oven, kitchen dresser (with drawer—pot-board under and shelves over); two-feet sloping desk, with shelves under and over; a fall-down, strong ironing-table, under window; surplice-hooks to doors; stone fender. In scullery: a stone-ware sink, with trap and pipe to drain; towel-roller on door, with fixed brackets; forest grate; twelve-gallon boiler and copper lid; shelves. In pantry: brick bench and wood shelves. To bed-rooms: shelf and brackets over, and three surplice-hooks to each door; iron bedsteads to each room; Nicholson's iron chimney-piece, stove, and fender to each fire-place.

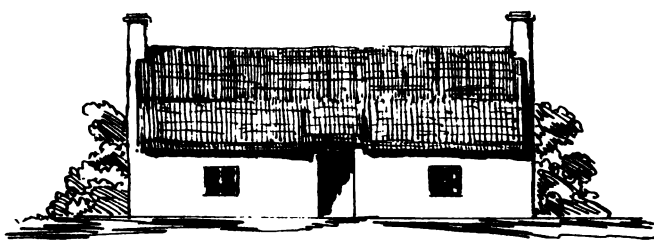
Perhaps no part of the interior fittings of a house is more associated with ideas of cheerfulness and domestic comfort than the fire-place. An abundant supply of coal has probably induced Englishmen to prefer the cheerful fire and the *comfortable fire-side* to any other mode of heating houses; open fire-places are also such excellent ventilators.

• The arrangement of the door in a room influences materially the proper action of a fire in a fire-place.

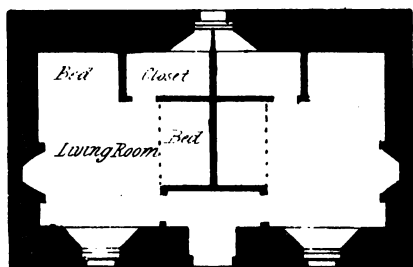
Sills to all outside doors to be placed two inches above the level of floor inside; thus leaving a space for a mat, so as to allow the door to pass over.



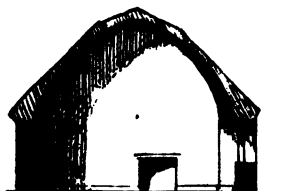
IMPROVED DOUBLE SCOTCH COTTAGE 1806.



*Elevation.*



*Ground Plan.*



*Transverse Section.*

*L30 Pin Cottage*

*Scale 1/16<sup>th</sup>*

With reference to the various designs introduced in the book, it is desirable to take a slight retrospective view of what has been done. A plan by Mr. Gillespie having appeared in the Royal Agricultural Reports, under the head "Cottages," we are induced to give the annexed Plate I., showing plan, elevation, and section of a double cottage. He says :—

"EDINBURGH, Feb. 18, 1806.

"Sir,—I beg leave to inclose you a sketch of a cottage, with an arched roof without any timber. The idea was taken from your circular cottages. There are few places in Scotland (the Highlands in general excepted) where such houses are wanted; but where wanted they could be built of the size described for £30 sterling, and they would last, it may be said, for ever. When the *arch is thrown*, it must be well grouted with lime, then puddled with clay, and thatched with straw or heather.

"I am to build some of the above kind of cottages this summer, and I shall trouble you with a distinct report when they are finished. I am much obliged to you for the hint.

"I remain, &c.

"JAMES GILLESPIE.

"TO SIR JOHN SINCLAIR, BART."

Cottages on this plan are called—and very justly—"hot-beds of disease and immorality."

In 1858, the Fourth Annual Report of the Directors of the Association for Promoting Improvement in the Dwellings and Domestic Condition of "Agricultural Labourers" in Scotland, with Hints on Cottage Building, appeared.

These plans show a great defect, by using the kitchen, or living-room, as a bed-room; some without a scullery; and



when a scullery is introduced, no provision for a copper, and apparently no back entrance; one of the upper bed-rooms receiving its light from a skylight.—Estimated cost for a double cottage, from £130 to £189 12s.

Plate II. describes faithfully a one-story cottage, containing kitchen, with bed and child's cot, two bed-rooms, scullery, pantry, &c.—Probable cost, £140.

The child's cot being in the kitchen, forms the parents' bed-room; shows bad arrangement, as there is no getting to the scullery, or wash-place, but through this room.

Great credit is due to Lord Kinnaird for the example he has given in building cottages and boothies on his property in Scotland. He insists upon the following rules being observed:—

1. A drain to be cast, three feet deep, round the cottage, at a distance of three feet from the outside of walls, with surface-gratings for waste water.

2. The floor of the cottage to be raised from eight inches to one foot above the level of adjoining ground, and filled up to the breadth of eighteen inches with broken metal round the interior walls. This prevents the intrusion of vermin, keeping the cottage dry.

3. The cottages to consist of kitchen, small room (with fire-place), two sleeping-closets off the kitchen (each with windows), interior porch, partitions of brick and wood, with small openings near the ceiling for ventilation.

4. Walls to be lined internally with hollow bricks, plastered, with recesses for cupboards.

5. Common clay circular pipes to be built into chimney the whole way up, and back of fire-place made concave.

6. A three-inch drain-pipe to be built into the wall at

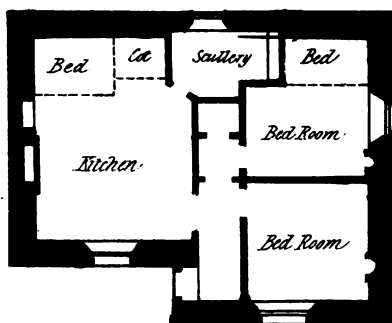
IMPROVED SCOTCH COTTAGE 1858



*End Elevation*



*Front Elevation.*



*Ground Plan.*

*Probable Cost £140.*

*Scale 1/16<sup>th</sup>*



basement, to supply air for fire; another two-inch pipe above chimney-place, with one end opening into room near ceiling, the other end at the bottom opening into chimney immediately above mantel-piece, for the purpose of ventilation.

7. The roofs to project about eight inches, with wooden spouts; the baulks to be kept up eighteen inches above the level of wall, which must be beam filled.

8. Windows, diamond-panes, to be made with zinc frame let into wood in four divisions, one upper one to open, hung on strong brass hinges, with iron handles to open and shut them.

9. Coal-shed, pig-stye, &c., to be erected at the back, some distance from dwelling-house.

Mr. James Gowans, of Pittacher House, Crieff, speaks well on the duties of landlords:—

“I have often thought that many proprietors, and those tenants who have the means, do not look either upon labourers’ dwellings or the labourers themselves in a true light. Much has been done by Government loans, as well as private expenditure, in the housing and feeding of cattle and the drainage of land, but comparatively little attention or money has been bestowed upon the improvement of the *labourers’ houses* or the *labourers* themselves; in short, I view the outlay on buildings of this description in the same way as the outlay upon drainage, as both will bring about the same results in a mercantile sense; while the former will begin that good which, flowing on from parent to offspring, would terminate ultimately in the *moral improvement* of this class of the population. More attention, therefore, should be paid, in framing new leases, to the improvement

of *hinds' houses*, equally with the drainage and improvement of the land ; and, in this view, it is obviously the interest of proprietors and tenants to build such dwellings as will invite to their service, and secure in their employment, labourers of a superior class, who will prove permanent residents and good members of society."

PLATE II. marks a great improvement in house accommodation for agricultural labourers in Scotland.

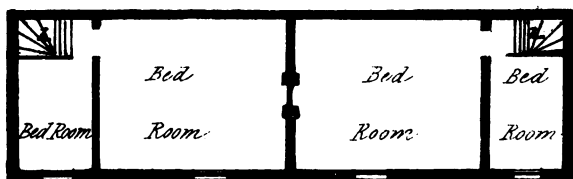
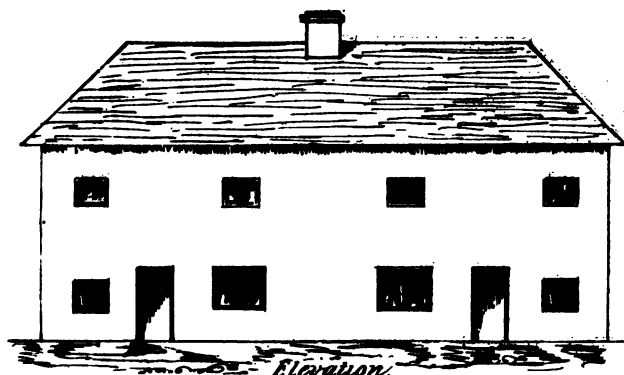
PLATE III.—Plans and elevations from Royal Agricultural Society's Reports, 1843, "On the Construction of Cottages," by the Rev. Copinger Hill.—Prize Essay.

A few remarks from the same may be useful :—

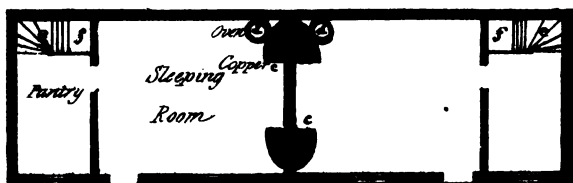
"Cottages are too much in the hands of speculators, who exact an exorbitant rent for very inferior accommodation. The owners of estates are deterred from erecting them, by dread of the expense ; feeling that they cannot demand and take from a poor man such a rent as would repay them for their outlay.

"If I should succeed in inducing gentlemen of landed property (by pointing out an economical mode of building comfortable cottages) to turn their attention to the subject, I shall be amply repaid for the trouble of furnishing the required information.

"Now, being myself owner of a considerable number of rural cottages, rented on fair terms, I am able to say, from the experience of several years, that the rents are paid with as much regularity as the Government dividends, and that the total loss upon twenty-four cottages in twelve years amounts to less than twenty shillings ; so that persons need not entertain any dislike to this description of investment from the difficulty of collecting the rents ; and I trust by the



Chamber Floor



Ground Plan.

ROYAL AGRICULTURAL SOCIETYS  
PRIZE ESSAY COTTAGE  
1843.

2 Cottages £120.

Scale 1/16<sup>th</sup>



time I have finished this article, they will be also fully assured that cottage building is not altogether an unprofitable investment of capital.

"The space I consider necessary for the accommodation of a rural labourer's family is a dwelling-room, about 13 feet square; a pantry, or cellar, about 8 feet by 13, including the stairs, and a closet under them; and two bedrooms over them.

"The outer door should open into the dwelling-room, instead of making the pantry a sort of entrance-hall, as some recommend.

"The light required for the dwelling-room is furnished by a window 3 feet 6 by 3 feet, and should be placed near the fire-place, in order that the housewife may have the advantage of the declining light as long as possible, while seated at her needle. The bed-room and pantry-window may be 2 feet 6 by 2 feet. The dwelling-room windows may be fixed; the others require an open casement. Ventilation requires a height of 8 feet below stairs, and 6 feet 4 inches above: the height will be 15 feet, including the floor. I do not like the low, thin-walled, slated cottages one sometimes meets with in gentlemen's grounds. A bed-room on the ground-floor, especially on a clay soil, is not desirable.

"Warmth and dryness cannot be ensured unless the walls are 14 inches thick, or 9 inches and battened within, or stud-work and plastered both sides.

"The aspect, if possible, should be a point or two to the westward of south.

"On the whole, I recommend a cheap material for walls, such as stone or clay, in preference to brick or stud-work, as well on account of warmth as that the builder may not



be tempted to stop short at three feet perpendicular height of wall in the chamber story, and gain the required height by means of a coved ceiling.

"I recommend also straw, or reed, or sedge, as a covering, both for the uniform temperature preserved by them and their reasonable cost. No one who has not experienced it can conceive the discomfort of a cottage covered with tile or slate. Ask the inhabitants, and they will tell you what they suffer from heat in summer and cold in winter. A thatched roof will last thirty years or more, being once 'roved' or 'ridged' at a trifling cost during the period. In the meantime the difference in prime cost between slate and thatch will have accumulated sufficiently to pay for a new roof.

"Cottagers like to have things to themselves. There must be no common oven or copper; neither is it necessary to have the oven or copper in a distinct apartment from the dwelling-room. The mother of a family can attend to the children while she is 'washing,' or 'baking,' or 'brewing,' if these operations are carried on in the dwelling-room, but not otherwise.

"The chimney must be an open one  $4\frac{1}{2}$  feet in the clear, and the jamb must be 2 feet  $1\frac{1}{2}$  in. deep. The back of one chimney, which is the partition between the two, must be nine inches; thus the base of the double chimney will be five feet, outside measure; having the mouth of the oven on one side of it. The copper, which is a tenant's fixture, may be beside the oven. The grate is also a tenant's fixture, and so are the shelves.

"Leaded casements are the most usual in cottages, but they are cold and fragile, the square form is more desirable

than the diamond. Cast-iron are neat and durable; they may be of any form, diamond or square, but they are expensive. Wooden are cheaper than either of the above.

“ Stone-work, fourteen inches thick and rendered inside with lime-mortar is warm and durable, and well looking; and in those districts in which stone may be had for little more than the raising, can be employed to advantage. Clay walls made in the manner I shall describe, and protected by thatch, are as warm, almost as durable, and with a little timely attention to repair, look as well.

“ Clay for building should be a clay-marl, if the clay is not good, chalk and road-grit should be mixed with it. The proportions of clay and chalk may depend on the goodness of the clay, and the facility of procuring chalk. With moderate clay, seven-tenths clay, two-tenths chalk, and one-tenth road-grit.

“ The clay and chalk are raised and carted to a convenient spot of hard ground, where they are beaten to pieces by a heavy prong, and the stones picked out, and formed into a circular bed one foot thick and twenty feet diameter.

“ The bed is well watered, and trodden by horses; and, while trodden, one man shakes short straw upon it with a fork, while another pulls it about with his prong, and throws the outside portions under the feet of the horses, and supplies a sufficiency of water. It can hardly be too much trodden. The clay-dauber's joke is, ‘ You spoil it if you tread it too much.’ A small cart-load of straw, or the buck of a waggon-full may be used to such a bed as I describe. It is then rounded up and covered with straw till wanted for use. When used, it is somewhat moister than brick-earth prepared for moulding.

“ A pinning of stone-work fourteen inches thick and one foot out of the ground is prepared ; the clay is carted and laid in heaps by the side of the pinning. One man gets upon the pinning with a small three-tined fork ; his partner throws up to him small lumps of clay, the size of a double fist, which he adroitly catches on his fork, and deposits smartly on the wall, walking backwards. A height of twenty inches or two feet is built at one time ; at intervals, as the work proceeds, the workmen coax the sides of the walls with their tools, and get it straight and erect ; it is then left to dry for a few days or longer—all depends on the weather. When sufficiently dry, another course is laid on till the requisite height is obtained. As the wall rises, window-frames and door-frames are fixed ; and when the roof is on, the dauber with his trowel cases the wall inside and out with clay, corrects all defects and irregularities, and leaves it smooth and white. The clay for casing is prepared with more care than for the body of the wall.

“ The wall so built retains its fresh appearance for very many years under thatch, and when repairs become necessary may be renewed again at a cost of three-pence per square yard, all expenses included ; and the second coat is as durable as the first. The writer has clay walls covered with thatch, which have been thus repaired within a few years, after standing forty years. Sometimes the casing of a new wall is delayed for a year.

“ If it is wanted to carry walls up a considerable height in one season, clay-bricks twenty inches by fourteen inches, and six inches thick, must be formed and dried in the sun, for a portion of the wall ; these may be set in clay-mortar

at any period of the erection. A very excellent parsonage house has been built in this way.

“The straw used is the short wheat-straw thrown out of the barn, fit only for littering the yards; not good enough for thatch or the riding-stable.

“Total cost of two cottages with clay walls and thatched roof, £120. With stone walls and thatched roof, £146 17s.

“The whole ground-plan of the double cottage here described, and the gardens may be about one quarter of an acre. A fence will be required all round, in length about twenty-six rods. This may be a ditch and bank, or bank only with a live fence of white-thorn. The whole of this may be done at two shillings per rod, finding the plants and putting in a dead fence to protect it in the first instance; two small gates will be required. The whole cost of fencing, gates, and necessary outbuildings may be put at £9 10s.

“The cost of building cottages containing the same accommodation as those I am describing, with any other material than stone, and clay, and thatch, is so great that no persons will be likely to take them in hand to whom estimates are an object.

“Labourers are sensible of the comfort of good houses, and would be able and willing to pay the sum, and this would yield an interest of  $5\frac{1}{4}$  per cent. on the outlay; which, added to the advantage in a social point of view of good dwellings for the poor, should be a sufficient inducement to the gentry to adopt this mode of improving their estates. Gentlemen who have timber of their own may bring it to a good market by cottage building. My calculation is made for the central part of Suffolk.

“One further suggestion I would make before I dismiss this subject; it is the propriety of building independent apartments, of small dimensions, for aged women, so that those who object to the Union House may continue to reside in the neighbourhood of their friends. A double cottage of this description suitable to them would cost £50.”

The plan of the above cottages in arrangement is very defective, no third bed-room, no scullery. Windows of such small dimensions as to be a positive eyesore to the external elevation, with the want of sufficient light inside, is a want of life.

The late Earl of Leicester, when T. W. Coke, Esq., commenced early in the present century to provide decent accommodation for his labourers, and endeavoured to instil into his tenant farmers minds, by his example, their duty to provide the same. This, in a great measure, was adopted throughout his vast property.

The present Earl of Leicester, at a recent Agricultural Association in Norfolk, gave utterance to the following judicious remarks :—“We are met together for the purpose of rewarding and encouraging the ‘Agricultural Labourer.’ This association can do a great deal, but a great deal rests with the *owner* of the *cottage* in which the labourer resides, and next with the occupier of the land on which he is employed. First, as to the owner of the cottage. I have the misfortune—at least a misfortune as far as I am concerned—to be a very considerable owner of cottage property. I have endeavoured, as far as I can, to improve the cottage of the labourer, and in doing so I trust I have both physically and morally improved his condition.

“In the first place, I have endeavoured in building up

cottages to provide such accommodation as will allow a human being to live in the way in which a man should live. In the next place, I have endeavoured to build those cottages at as little possible loss to myself as I can. To expect a profit from cottage property, without screwing the tenant, is impossible. By not allowing lodgers to be taken in, by enforcing a few other simple rules which it is necessary to make with the labouring classes, and by having my tenants, in nearly every case, directly under me as their landlord, I firmly believe that I have improved their condition both physically and morally.

“Now, as to the master who employs the labourer. When I, as an owner of cottage property, have done as much as I possibly can to improve the condition of the labourer, much still rests with the master who employs him. I believe, a *good master makes a good man*. I believe if a little more attention is paid in looking after the labourers we employ, we may make them, in many cases, much more efficient, and give them a much greater interest in the soil on which they work, and the prosperity of the master who employs them. I believe that when we take labourers from another farm, by making a few inquiries into their characters at the place which they have left, by paying the same kind attention to them that we pay to our domestic servants, by taking, in short, an interest in them which we have not hitherto displayed, we might induce among labourers a regard for character which at present does not exist sufficiently in our district. You have, no doubt, seen the letters which have appeared in the ‘*Times*,’ in reference to Norfolk labourers. As far as my experience goes, and I have been a great employer of labour, and am well acquainted

with the habits and feelings of the labouring classes, I believe no county in England will produce a labourer who will do so much work for the money paid him. At the same time, there are vices in the Norfolk labourer which it should be in our power to eradicate. One of the great evils we have to contend against is the vice of drunkenness. As an employer, I find I can deal with men, let their vices be what they will, if they are not given to drunkenness. With the drunkard I can do nothing. On the Friday, when he is paid, he goes to his beer-shop, and he won't appear again till Tuesday, and then he will come back in such a state that it is useless to employ him. I firmly believe that if we set our shoulder to the wheel much might be done; and as far as I am concerned, I am ready to give you assistance both in time and money. It has been the custom at Holkham, to give a large sum every year as a *largess*; it has all gone in drink, and I am ready to give the sum, and double that sum, to assist any persons who are willing to use their energies to put a stop to that which I believe is a very great evil in this county.

“With respect to the question of education, I think that the plan of establishing a library for the poor would be productive of very considerable benefit, and I think if a certain portion of the artisans, tradesmen, bricklayers and labourers in a parish could be induced to read, their example would induce others to learn to read also. The great difficulty we have to contend with is this, it is all very well to talk about school and education; but we hold out such inducements to boys six or seven years old, that in a large family it would be very unnatural if fathers kept their sons at school when they can earn three or four shillings a week.

Boys in this district of Norfolk can get certain employment when they are seven or eight years old; they are removed from school at about that age, and I think the most desirable plan would be to endeavour, if possible, to teach those boys in adult schools, when they are old enough to see for themselves that it is desirable to learn. A library may have this effect, it may induce young men, instead of spending their time at public-houses and beer-shops, to learn to read, and to endeavour to put themselves in the same position as those who have already been educated."

The various Labourers' Friend Societies formed in all parts of this country shows the great desire evinced by the employers of "Agricultural Labourers" to improve their condition by worthy stimulants. At one established in Essex, the Rev. W. Shepherd said he thought he might say, that for the nineteen years he had been connected with the society, they had been going on, year by year, promoting the welfare of the various classes around them, and giving effect to the object they had in view, by bringing before them the most meritorious cases of skill in husbandry, and of continued service, digging out of the soil, as it were, those worthy characters, and bringing home to the various *cottages* of the district the operations of the Societies, showing to the labouring poor that they desired not only to see them in the field, but to make them comfortable at their fireside. One reason, perhaps, that the Society has gone on successfully from year to year was, that it brought into its operation common sense. That was the broad ingredient that oiled the wheels of success in every class of life. Another secret of success, and of much importance, is the bringing together the various orders and classes of



society. As the British Constitution was made up of three estates, so they also formed three estates, Labourers, Tenants, and Landlords; but there was one golden link binding them together,—the consciousness that they were fellow-creatures, created by the same Heavenly Father, and having, they trusted, the same heavenly destination. This gave them consolidation. He felt satisfied that the union of labourer, employer, and landlord, was a union they must not value too slightly; might the servant ever respect the master, and the master ever feel an interest in the welfare of his servant, and a fellow-feeling make them kind to each other.

He thought that in the intercourse of one with another they were apt to forget,—the master was apt to forget,—that the servant had feelings, and ought to make allowance for the common frailty of our nature that attaches to all. He thought if they could all feel that more, and he did not accuse any one of not doing so, but he spoke generally,—they should have more of the feeling of brotherhood, and it would make them more and more tender of the feelings of those they had to serve them. The union of labourer, tenant, and landlord, was a truly wreathed column, whose capital bore the inscription “Union is strength;” and let them be actuated by the love which calleth on them to do to others as they would others should do unto them.

Lord Palmerston, the present Prime Minister, is one of those landlords who consider their duty to provide decent *houses* for the “Agricultural Labourer” working upon their estates. He says justly, the wages received by the labourer is such that it is out of his power to pay in weekly rent sufficient to make cottage building an investment to pay

a fair per-centage ; but he considers the farmsteads are not perfect unless the landlord provides cottages for the labourer as a necessary appendage to a farm, in the same manner as the dairy is to a farm-house ; as such, he places the investment on the acreage of the farm.

The model cottages built at Broadlands do his Lordship much credit. A great mistake, however, has been the increasing their cost unnecessarily, by the rooms being much larger, with walls finished inside more expensively, than is at all desired by an agricultural labourer, thus causing these "model cottages" to become the *exception* and not the *rule*.

It is all very well for large landed proprietors to do this, provided it was done by all ; but go England through, they show only as rare exceptions. It would have been much better had these well-disposed men adopted the plan recommended by us, viz., to provide "healthy moral homes" at such a cost as to meet the low wages received by the "agricultural labourer," so that the owner of such cottages would receive a fair interest for his outlay, believing that had such been the case, "healthy moral homes" would have been the *rule* and not the *exception*.

---

Dr. Samuel Johnson in his stupendous Dictionary says :

COTTAGE, noun substantive ; from (cot), a hut, a mean habitation ; a cot, a little house.

"The sea-coast shall be dwellings and cottages for shepherds, and folds for flocks."—*Zeph.* ch. 11, v. 6.

"They were right glad to take some corner of a poor cottage, and there to serve God upon their knees."—*Hooker*.

"The selfsame sun that shines upon His court, hides not his visage from our *cottage*, but looks on both alike."—*Shakespeare's Winter's Tale*.

"It is difficult for a peasant, bred up in the obscurities of a *cottage*, to fancy in his mind the splendours of a Court."—*South*.

"Let the women of noble birth and great fortunes nurse their children, look to the affairs of the house, visit poor *cottages*, and relieve their necessities."—*Taylor's Holy Living*.

"Beneath our humble *cottage* let us haste,  
And here unenvied rural dainties taste."  
*Pope's Odyssey*.

Cottage, a name morally applied to a small house, erected for the use and accommodation either of the farm labourer or those engaged in some other occupation, but more generally of those employed in agriculture.

The word *cottage* is also used in modern parlance to designate a small elegant residence, more properly a villa, or, as sometimes called, a *cottage ornée*. Houses of this description, however, do not belong to our present subject, which must be understood as treating of the *cottage* in the acceptation of the term in accordance with the title of the book.

Cottages were formerly constructed of rude and perishable materials; as earthy substances mixed with straw; and cottages of this consistence were denominated *mud cottages* in some districts, and *cob and dab* in others, but these are now giving way to a more durable kind, which, more expensive, are much more comfortable, and cheaper in the end, as they require little or no repairs for many years.

In the construction of cottages, economy, convenience, cleanliness, comfort, and decency, must be the chief points in view, and these ought to be united with as much picturesque beauty as circumstances will admit.

The accommodation required is not such as would be looked for by persons moving in a higher sphere of life, and who are accustomed comparatively to luxuries; the agricultural labourer belongs to a totally distinct class of society.

Let the dwellings of the poor be scientifically constructed, and much illness and misery will be prevented; in effecting this, the whole community is interested, as parochial expenses are increased or diminished according to the healthy state of the labouring population.

Cottages should be warm and substantial. Judgment will also be displayed when the architectural character of the building is in harmony with its use. Their exteriors may be made exceedingly ornate by the application of a correct taste, which does not necessarily create much expense; and although ornament is not a necessary appendage to stability or comfort, it frequently happens the ornamental buildings are preferred, and when judiciously disposed, will materially assist in heightening the landscape. It thus becomes a question with the owner of an estate, whether he will, in the erection of cottages, incur a small additional outlay for this purpose.

England has justly been designated a cultivated, and perhaps in no particular possesses a greater pre-eminence in appearance over other countries, than in the beauty of her rural scenery, which it is submitted, may be greatly enhanced by the introduction of cottages erected in accordance with architectural principles, in lieu of the clumsy-looking, and comfortless buildings erected in many districts.

In the erection of cottages, it is preferable to build them

in pairs if possible, as the cost is considerably less than when singly placed, and they are much warmer. The *site* also is a most important consideration, as houses placed on low marshy soils are liable to be damp. Independently of the miasma arising from the surface of the ground in such situations, there is a continued humidity in the atmosphere, which communicates itself to all objects surrounded by it. This vapour is a deadly poison, acting in the human system through the medium of the lungs, and producing fevers and other epidemics.

How much may the picturesque appearance be increased by simply formed entrance porches, overhanging roofs, and stacks of chimney shafts, having ornamental summits. The porch, independent of its architectural effect, affords both warmth and shelter, giving a quiet repose to the eye, as does also the overhanging roof; the lofty chimney clustered shafts, besides assisting to prevent smoky rooms, have at all times a pleasing appearance.

Good drainage is indispensable; this may generally be obtained at a small cost. The common glazed earthenware pipes, three inches diameter, are sufficiently large to carry off the drainage from a cottage.

All drains should be trapped with a syphon trap, thus preventing the escape of foul air, and the admission of vermin into the dwelling.

The drain should empty into the manure tank adjoining the *nécessaire*, watering-place and pigstye.

Cottages may be divided into several classes, or sizes. One of the smallest size for a labourer and his wife, having no children, contains a living-room, bed-room, scullery, and pantry with perch. Next size requires living-room, 2 bed-

rooms, scullery, pantry, and porch. Third size the same accommodation, with three bed-rooms.

The rooms to each cottage are planned to a minimum size, so as to be useful, at a cost to yield a good investment from a moderate rent.

The above three classes of cottages of larger dimensions are suitable for artisans and superior agricultural labourers, who, by their industry, forethought, and superior intelligence, consequently receiving higher wages, require more luxurious dwellings, affording to pay higher rent than those of the most common agricultural labourers.

As it is our intention to give the quantities of the various materials required in producing the different cottages, a few remarks on the qualities of the materials forming the walls, the roofs, the floors, and all other matters appertaining thereto, will be found useful :—

**WALL**, noun substantive ; (*wal*, Welsh ; *vallum*, Latin ; *pall*, Saxon ; *walle*, Dutch) :

“A series of brick or stone, or other materials, carried upwards, and cemented with mortar ; the side of a building.”—*Dr. Johnson*.

Walls are provided of the following materials :—

Rammed earth called “pise” walls. A full description of forming these walls is described at page 64.

Concrete walls, from ground stone, lime, small stones, and sand. Also walls formed wattle and dab.

Clay walls as described at page 16.

Stud-framed walls, either weather-boarded outside, and lath and plastered inside, or lath and plastered both sides, or brick-nogged, either brick on edge or brick flat.

Brick walls, either nine or fourteen inches thick, either built solid or hollow.

Stone pebbles and flint, with brick quoins at angles, and round windows and doors.

Stone walls, either in random course, or straight, or rubble-work.

Roof, noun substantive ; (hrop, Saxon) :

“The cover of a house.”—*Dr. Johnson.*

“No, rather I abjure all *roofs*, and chuse  
To wage against the enmity o’ th’ air.”

*Shakespeare.*

“I’ll tell all strictly true,  
If time, and foode, and wine enough accrue  
Within your *roofs* to us ; the freely we  
May sit and banquet.”

*Chapman.*

“Large foundations may be safely laid,  
Or houses *roofed*, if friendly planets aid.”

*Creech.*

Roofs close boarded, and covered either with prepared paper, asphalted felt, or with patent fibrous slab, or with prepared iron, or galvanised iron, or zinc metal, for the above roof coverings. The roof may be nearly flat, with small scantlings for timbers.

Roofs covered with pantiles and slates require greater pitch and larger scantlings. Stone slates and plain tiles require still greater pitch, with stronger timbers.

Thatch roof, the most picturesque ; warm in winter, cool in summer.

## FLOOR, noun substantive :

## 1. THE PAVEMENT.

"A pavement is always of stone, the floor of wood or stone ; the part on which one treads."—*Dr. Johnson.*

"His stepmother, making all her gestures counterfeit affection, by almost grovelling upon the floor of her chamber."—*Sidney.*

"He rent that iron door  
Where entered in, his foot could find no floor,  
But all a deep descent as dark as hell."

*Fairy Queen.*

"Look how the floor of heaven  
Is thick enlaid with patens of bright gold :  
There not the smallest orb which thou beholdest,  
But in his motion like an angel sings,  
Still quiring to the young-ey'd cherubim."

*Shakespeare.*

"The ground lay strewed with pikes so thick as a floor is usually strewed with rushes."—*Hayward.*

"He winnoweth barley to-night in the threshing floor."—*Ruth.*

## 2. A STORY ; A FLIGHT OF ROOMS.

"He that building stays at one  
Floor, or the second, hath erected none."

*Jonson.*

"Hewn stone and timber to floor the houses."—*2 Chron. v. 34.*

"The flooring is a kind of red plaster made of brick ground to powder, and afterwards worked into mortar."—*Addison.*

Floors can be formed of compressed earth, of concrete, of pounded brick and ground lime, of plaster, of asphalt, of brick, of tile, of slate, of stone, and of wood.

A good composition floor for cottages is made of lime, sand, and furnace dust (which can be had at any of the iron works). The latter is mixed with good lime mortar to such a consistency as to be easily wrought, a bed of dry stone



shivers, or road metal, six inches thick, ought to be made, on which the mortar should be spread to the thickness of three inches, levelling it with a common trowel one inch above the finished level of floor. It is then beat with the back of a spade, or plumber's dresser, until it is brought to the required level. The sand should be of the coarsest and sharpest that can be obtained.

A ton of furnace dust mixed with lime mortar will lay sixty square yards three inches thick. This will be found to make a most durable hard and dry floor.

In some of the midland counties the floors to chamber story are run with plaster on laths five pecks to the superficial yard, and mostly two coats pane drawn underneath between the joists.

23½ cubic feet of sand, 17½ do. of clay, 13 do. of chalk, equal 1 ton.

A cubic yard of earth before digging, will occupy 1½ cubic yards when dug.

27 cubic feet, or one cubic yard, contains 21 striked bushels, which is considered a single load, and double these quantities a double load.

	Ins.	Ins.	Ins.	lbs. oz.
A stock or plain brick . . . .	8½ long,	4½ wide,	2½ thick,	weighs 5 0
Well-made country do. . . .	9 "	4½ "	3 "	" 6 0
Paving brick . . . .	9 "	4½ "	1½ "	" 4 0
Dutch clinker . . . .	6½ "	3 "	1½ "	" 1 8
Pantile . . . .	13½ "	9½ "	½ "	" 5 4
Bridgewater do. . . .	14 "	14 "	½ "	" 6 0
Plain tile . . . .	10½ "	6½ "	½ "	" 2 5
Foot-paving tile . . . .	12 "	12 "	1½ "	" 13 0
Ten-inch do. . . .	10 "	10 "	1 "	" 8 9
Pantile laths, 10 ft. bundle .	120 feet	1½ "	1 "	" 4 6
" " 12 ft. " . . . .	144 "	1½ "	1 "	" 5 0
Plain laths for tiling . . . .	500 "	1 "	½ "	" 3 0

Thirty bundles of laths one load.

272 feet superficial is a rod of brickwork, 1½ brick or 13½ inches thick, called in London the standard thickness, to which all brickwork of whatever thickness is reduced.

306 cubic feet or 11½ cubic yards, equal to 1 rod of reduced brickwork.

4300 stock bricks to 1 rod reduced, 4 courses 11 inches high.

4500 " " if the 4 courses measure  $11\frac{1}{2}$  high.

4900 " " laid dry in wells or cesspools to a rod.

A rod of brickwork contains 235 feet cube of bricks, and 71 feet of mortar (4 courses to a foot): which will weigh, upon an average calculation, 15 tons.

A rod of brickwork requires  $1\frac{1}{2}$  cubic yards of chalk lime, and 3 single loads or yards of drift; or 1 cubic yard of stone lime, and  $3\frac{1}{2}$  single loads or yards of sand; or 36 bushels of cement, and 36 bushels of sharp sand.

16 bricks to a foot of reduced brickwork.

7 " to a foot super. of facing.

10 " to a foot super. of gauged arches.

30 " on edge and 45 bricks flat to 1 yard super. brick nogging.

36 stocks laid flat and 52 stocks on edge to 1 yard of paving.

36 paving bricks laid flat and 82 do. on edge, to 1 yard of paving.

9 foot tiles, or 13 ten-inch do., to 1 yard of paving.

140 Dutch clinkers on edge to 1 yard of paving.

A load of mortar, 27 feet cube, requires 9 bushels of lime and 1 yard of sand.

Lime and sand loses one-third of its bulk when made into mortar.

Plain tiles will require to a square, if each tile shows on the face 4 inches, 600;  $3\frac{1}{2}$  inches, 700; 3 inches, 800. 1 bundle of laths and nails, 1 peck of tile pins, and 3 hods of mortar; or 210 tiles to a square of flat roofing.

Pantiles will require for a square, 180 to a 10-inch gauge; 154 to an 11-inch; and 130 to a 12-inch gauge; 1 bundle of laths and  $1\frac{1}{2}$  lb. of 6d. nails.

Bridgewater pantiles, 100 to a square.

A hod contains 20 bricks.

Lime, or cement and sand, to make mortar, requires as much water as is equal to one-third of their bulk, or about  $5\frac{1}{2}$  barrels for a rod of brickwork built with mortar.

1 bushel of cement will cover  $1\frac{1}{2}$  square yards 1 inch thick;  $1\frac{1}{2}$  yards  $\frac{3}{4}$ -inch thick;  $2\frac{1}{2}$  yards  $\frac{1}{2}$ -inch thick.

1 bushel of cement and 1 bushel of sand will cover  $2\frac{1}{2}$  square yards 1 inch thick; 3 yards  $\frac{3}{4}$ -inch thick;  $4\frac{1}{2}$  yards  $\frac{1}{2}$ -inch thick.

1 bushel of cement and 2 bushels of sand will cover  $3\frac{1}{2}$  square yards 1 inch thick;  $4\frac{1}{2}$  yards  $\frac{3}{4}$ -inch thick;  $6\frac{1}{2}$  yards  $\frac{1}{2}$ -inch thick.

1 bushel of cement and 3 bushels of sand will cover  $4\frac{1}{2}$  square yards 1 inch thick; 6 yards  $\frac{3}{4}$ -inch thick; 9 yards  $\frac{1}{2}$ -inch thick.

1 cubic yard of chalk lime, 2 yards of road drift or sand, and 3 bushels of hair, will cover 75 yards of render and set on brick, and 70 yards on lath; or 65 yards of plaster or render 2 coats and set on brick, and 60 yards on lath; floated work will require about the same as 2 coats and set.

1 bundle of laths and 500 nails will cover about  $4\frac{1}{2}$  yards.

Slates called doubles, are 18 in. by 6 in.,	1000 will cover 2 squares,	weighs $\frac{3}{4}$ ton.
" " ladies, 16 " 8	" " 4 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "
" " countesses 20 " 10	" " 7 "	2 "

1 ton of 6-inch and 7-inch granite paving will cover 4 yards super.  
 1 ton of 9-inch do., 2 $\frac{1}{2}$  yards; 1 ton of pebble paving, 4 $\frac{1}{2}$  yards.  
 70 feet super. 2 $\frac{1}{2}$ -inch York paving, weight 1 ton; 58 feet of 3-inch do., 1 ton; 54 feet of 3-inch granite, 1 ton.

The fir timber in general use is imported from Memel, Riga, Dantzic, and Sweden; also Canada, Memel, and Red pine is the most convenient for size; Riga the best in quality; Dantzic, when free from large knots, the strongest; and Swede the toughest. Riga can always be depended upon, and although dearest in price, is the cheapest in the end. Red pine may be used anywhere; its durability and strength is equal to the North of Europe timber. The Quebec yellow pine may be used in the dry; the lower port timber requires great caution—if upon opening it appears woolly, or not bright, it should not be used for building purposes.

In selecting timber, avoid spongy heart, porous grain, and dead knots; the latter is a prognostication of a rotten core; choose the brightest in colour, and where the strong red grain appears to rise on the surface, which open bright red and not woolly. The most convenient pieces for converting to building purposes are thirteen inches square.

Deals are from Norway, Sweden, Prussia, Russia, and Canada.

For framing, the best deals to be depended upon are the Norway, particularly the Christiania battens; and for panneling the Christiania white. Yellow Christiania deals cause much waste, being generally sappy. The best floors are Wram and Christiania whites. Stockholm and Gefle yellow for ground floors; Archangel and Onega plank

for warehouse floors and stairs; Petersburg, Onega, and Christiania battens for best floors. Swedish deals are not to be depended upon for framing. White spruce deals, with fixed knots, wear well for common chamber floors; and good sound pine, when well seasoned, admirably adapted for inside framed doors, more especially when the work is to be stained and varnished.

120 deals are denominated one hundred.

600 feet super. of inch boards, 1 load of timber.

12 twelve-feet boards to 1 square of flooring.

13 twelve-feet do. wrought and laid folding.

17 twelve-feet battens, do do.

54 feet cube, 1 load of timber.

100 feet super. 1 square.

Deals are 9 inches by 3 inches.

Planks are 11 inches by 3 inches.

Battens are 7 inches by  $2\frac{1}{4}$  and 3 inches.

54 feet cube of timber,	1 ton	60 feet cube of elm,	1 ton
56 " " deal,	1 "	51 " " beech,	1 "
45 " " oak,	1 "	39 " " ash,	1 "
34 " " mahogany,	1 "		

#### LINEAL MEASURE.

12 inches	make	1 foot	7.22 inches	make	1 link
3 feet	"	1 yard	100 links or 6 ft.	"	1 chain
16 feet 6 inches	"	1 rod	10 chains	"	1 furlong
220 yards or 40 rods		1 furlong	80 chains	"	1 mile
1760 yds. or 8 furlongs		make 1 mile			

#### CUBIC MEASURE.

1728 cubic inches	1 foot
27 feet	1 yard
50 feet	1 load of timber
277 $\frac{1}{2}$ cubic inches	1 imperial gall.

#### LIQUID MEASURE.

2 pints	1 quart
4 quarts	1 gallon
8 gallons or 4 pecks	1 bushel

#### SQUARE MEASURE.

144 sq. inches	1 foot
9 sq. feet	1 yard
100 sq. feet	1 square
272 $\frac{1}{2}$ sq. feet	1 rod, pole, or perch
40 sq. rods	1 rood
4 roods or 4840 yards	1 acre
10,000 sq. links	1 square chain
10 sq. chains	1 square acre

## ASPHALTE FLOORS.

	$\frac{1}{2}$ -inch. s. d.	$\frac{3}{8}$ -inch. s. d.	$\frac{1}{2}$ -inch. s. d.	1-inch. s. d.
Seysell asphalte, per square foot . . . . .	0 7	0 8	0 10	1 1
<i>Patent Metallic—</i>				
C quality . . . . .		0 4	0 5	0 6
B „ . . . . .		0 4 $\frac{1}{2}$	0 5 $\frac{1}{2}$	0 6 $\frac{1}{2}$
A „ . . . . .		0 5	0 6	0 7
Trinidad asphalte . . . . .	0 3	0 3 $\frac{1}{2}$	0 4	0 4 $\frac{1}{2}$

Tar pavement, 2 $\frac{1}{2}$  inches thick, 2s. 3d. per yard.

Martin's cement makes an excellent floor laid on concrete, in equal proportions of cement and sand mixed stiff,  $\frac{1}{8}$  in. thick, and finished off with a coat  $\frac{1}{8}$  in. thick of pure cement.

1 cwt. mixed with equal quantities of sand will cover between 60 and 70 square feet.

Keene's patent marble cement, the fine quality, is white, and takes a beautiful polish; the coarse quality forms an extremely hard quality for internal purposes, cost 3s. per bushel, in five-bushel barrel, 3 cwt.

Parian cement used as a stucco, cannot be distinguished from statuary or Parian marble. It does not crack, warp, or efflore in any degree, 3s. per bushel in four-bushel barrel. Four bushels of cement, with an equal portion of clean-washed sharp sand, will stucco 90 square feet  $\frac{1}{2}$  in. thick.

Portland cement. In appearance and hardness, approximates to Portland stone; labour the same as to Roman cement. Price 2s. per bushel, weight of a five-bushel cask, 400 lbs. It will take three of sand to one of cement, for plaster will carry nine of sand to one of cement.

Roman cement. Price 1s. 4d. per bushel, five-bushel cask, 3 $\frac{1}{4}$  cwt.

Johns and Co.'s patent stucco cement, price 12s. per cwt.

**Metallic cement.** This cement does not require colouring or painting. Price 1s. 3d. per bushel; do., fine, 1s. 6d.

**Mastic.** This composition is intended for work to be immediately painted. Price 4s. 6d. per cwt.

**Atkinson's Cement.** This cement is of a warmer colour than Portland cement, and being quick setting, is generally used for cast work. Price 3s. per bushel.

Rain water and other pipes, water-closets, &c., &c.

		O. G.		Pipes,		Sq. heads.		O. G. heads.		Oct. hds.		Shoe.	
		d.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
Zinc	2-in. Gutter	3		0	4½	2	3	3	0	4	6	1	0
	2½	3½		0	5½	2	9	3	6	4	6	1	6
	3	4 to 4½		0	7	3	3	4	0	5	0	1	6
	3½	4½	5½	0	8½	3	9	4	6	5	6	2	0
	4	5½	6	0	10	4	3	5	0	6	6	2	2
	4½	6½	6½	1	0	4	9	5	6	6	6	2	6
	5	7	7	1	2	5	3	6	0	7	0	2	1

A quantity required, manufacturers make a considerable reduction.

2 iron ...	2	0	2	2	0	0	9
2½ „ ...	2½	0	3	2	6	1	3
3 „ ...	3	0	3½	3	0	1	6
3½ „ ...	3½	0	4	3	6	1	9
4 „ ...	4	0	4½	4	0	2	0

Zinc chimney tubes, per foot, run 10 inches, 2s.; 11 inches, 2s. 6d.; 12 inches, 3s.

Perforated zinc plates for ventilation, also for meat safes, 4d. per foot super.

Common lead house pump, 2½-inch, 30s.; 3-inch, 40s.; 3½-inch, 50s.; 4-inch, 60s.

Force lead pump, 2½-inch, 55s.; 3-inch, 75s.; 3½-inch, 90s.; 4-inch, 110s.

Patent brass barrel lift pump on plank, 2½-inch, 110s.; 3-inch, 130s.; 3½-inch, 150s.

Water closet apparatus, pan closet with queen ware basin, cistern valve, ball lever, crank, &c., complete, except trap and water box

Lambert's closet with iron-enamelled basin, and trap, complete	1	2	0
Jennings' yellow earthenware closet traps, white inside	0	18	0
Ridgeway's pottery ware closet basin, with syphon trap	0	13	6
Ridgeway's urinal	0	10	0

A piece of paper is 12 yards in length and 21 inches wide, containing 7 square yards, or 63 feet superficial ; it is customary to allow 1 piece in 7 for waste.  $4\frac{1}{4}$  square yards 1 French piece.

A dozen of borders is 12 yards, or 36 feet run.

To find the number of yards running, or pieces of paper, there are in a superficial quantity—divide the number of superficial feet by five, will give the number of yards ; and divide the yards by twelve, will give the number of pieces.

FOUNDATION, noun substantive (*fondation*, French) :—

“The basis or lower parts of an edifice.”—*Dr. Johnson*.

“The stateliness of houses, the goodliness of trees, when we behold them, delighteth the eye ; but that *foundation* which heaveth up the one, the root which ministereth unto the other nourishment, is in the bosom of the earth concreted.”—*Hooker*.

“That is the way to make the city flat,  
To bring the roof to the *foundation*,  
To bury all.”

*Shakespeare's Coriolanus.*

“I draw a line along the shore ;  
I lay the deep *foundation* of a wall,  
And Enos, named from me, the city call.”

*Dryden.*

On moist soil for the common class of cottages, the excavation for the foundation may be very slight, more particularly those having rooms on the ground-floor ; six inches in depth would be ample, as in all cases, the ground is to be made up at least *six inches* against the external wall, higher than the surrounding ground. Well ram the ground before placing the footings, and should the soil show damp, or a mixture of gravel and clay, instead of brick footings put down concrete, six inches deep, eighteen inches wide.

CONCRETE, verb neuter (*concreresco*, Latin) :—" to coalesce into one mass ; to grow by the union and cohesion of parts :"

"Formed by concretion ; formed by coalition of separate particles into one mass."—*Dr. Johnson*.

"The mineral or metallic matter, thus *concreting* with the crystalline, is equally diffused throughout the body of it."—*Woodward*.

"The blood of some who died of the plague could not be made to *concrete*, by reason of the putrefaction begun."—*Arbuthnot*.

"That there are in our inferior world divers bodies that are *concreted* out of others, is beyond all dispute ; we see it in the meteor."—*Hale's Origin of Mankind*.

Concrete, to form, mix as follows :—one part of *ground-stone lime*, six parts of stone chippings or broken flints, and one part of coarse sharp sand, these to be well and thoroughly mixed, then add water sufficient to amalgamate the mass as mortar, throw the same into the trench. Before this is done, to save trouble, drive a few small stakes about six feet apart in the middle of the trench, their tops to be level with each other, serving as a guide to prove the concrete level all round.

Should brick footings be used instead of concrete (concrete is always preferred as no damp will rise through it), one brick in height by eighteen inches wide. On the footing place 6 courses in  $1\frac{1}{2}$  brick thickness, thus forming an outside plinth line, the same forming the level to floor off the living-room. The floor to scullery being six inches lower, and floor to coal-cellar and pantry level with the footings.

Put a coarse coating of coal-tar and sand well mixed, and put on hot over the whole surface of the wall, three courses above the footings ; be particularly careful as to the foundation for the chimney-stack.



Choose the hardest bricks for the footings and foundation wall to the sett-off; if they are regular burnt clinker-bricks so much the better, and cost less in price.

PLATE IV.—Plan, elevation, and section, of a cottage for a man and his wife without children. The accommodation consists of a living-room, 10-6 × 9-9; bed-room 8-0 × 6-0; scullery 6-9 × 4-9; pantry 6-0 × 3-0; front porch to project 3-0, enclosed 4-0 high in front, and one end. A back porch. This plan would be equally useful by having only one entrance through the scullery.

*Bill of Particulars.*

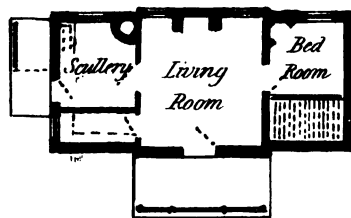
	£	s.	d.
210·0 cube concrete to footings and plinth . . . . .	0	18	4
553·0 super. outside wall of clay, at 2d. . . . .	4	12	2
48·0 „ 1½ brick chimney breasts, at 8d. . . . .	1	12	0
28·0 „ ½ brick on edge, at 2½d. . . . .	0	5	10
10 feet of 8-in. chimney flue and 10 feet of 6-in. do . . . . .	0	12	6
332 feet super. of asphalted felt on ½-inch close boarding on rafter, 3½ by 1½ in., including collars as ceiling joints, with four wall plates, at 3d. . . . .	4	3	0
24 ft. run of zinc eaves gutter, 16 ft. 2 in. of down pipe, and 2 shoes . . . . .	0	18	0
186 ft. super. of concrete floor, at 1d. . . . .	0	15	6
1 brick step to dairy . . . . .	0	2	0
21 yards of lath lay and set ceiling, at 1s. 6d. . . . .	1	11	6
60 yards of lime white, at 1½d. . . . .	0	7	6
4 pair of 1½ in. sliding sash casements, with friction rollers top and bottom, and screw fastening in solid beaded fir frame 3½ by 2½ in., with weathered and throated sill 7 by 2½ in., sashes glazed with 20 oz. glass, stained and varnished, at 20s. . . . .	4	0	0
1 inch ledged outside door, beaded, grooved, and iron-tongued or filleted, hung with 20-inch garnets to solid rebated and beaded fir frame 4 by 3 in., two 6-in. rod bolts, 10-inch stock lock, Norfolk thumb latch; stained and varnished; York stone sill, 11 by 2½ in. . . . .	1	0	0
Carried forward . . . . .	£20	3	4



*Elevation*



*Section*



*3 Roomed Cottage*



Brought forward . . . . .	£	s.	d.
	20	3	4
Four $\frac{3}{4}$ -inch ledge doors rebated and beaded, hung with 14-inch garnets to solid rebated and beaded fir frames $3\frac{1}{2}$ by $2\frac{1}{4}$ in., thumb latch, and two 6-in. rod bolts to scullery doors; latch with secret bolt to bed room door; iron button to pantry door, York stone sills, 9 by $2\frac{1}{4}$ in. . . . .	3	10	0
$1\frac{1}{4}$ in. shelf and bracket to living room chimney, inch ditto to bed room . . . . .	0	4	6
21 feet run of inch deal shelf to pantry, scullery, and bed room . . . . .	0	10	6
36 feet run of 3 by 1 in. bond to brick on edge partitions . . . . .	0	3	0
To 2 porches with rough saplings . . . . .	1	10	0
	£26	1	4
	£	s.	d.
	26	1	4
To build walls—compressed earth or concrete . . . . .	2	6	1
	28	7	5
	26	1	4
“ “ stone pebble and brick quoins to ex- ternal angles and round doors and windows . . . . .	3	9	0
	29	10	4
	26	1	4
“ “ stud framed with outside weather board . . . . .	2	6	1
	28	7	5
	26	1	4
“ “ ditto ditto and lath 1 coat set . . . . .	6	18	3
	32	19	7
	26	1	4
“ “ 9-inch brick built hollow . . . . .	6	18	3
	32	19	7
	26	1	4
“ “ 9-inch brick built solid . . . . .	9	4	0
	35	5	4
	26	1	4
“ “ 14-inch stone rubble work . . . . .	6	18	3
	32	19	7
To cover the roof with pantiles, will cost additional . . . . .	0	13	10
“ “ “ plain tiles, “ “ . . . . .	1	7	8
“ “ “ slate, “ “ . . . . .	2	15	4
To wood floor joists and sleepers to living room and bed room, will cost additional . . . . .	1	1	8

## TO FITTINGS.

	£	s.	d.
2 ft. 6 in. range, with oven set complete . . . . .	1	16	0
14-in. grate to bed-room . . . . .	0	7	0
8 gall. galvanized copper and fire work . . . . .	0	12	6
2 ft. stone ware sink and 10 ft. 3 in. drain with syphon . . . . .	0	7	6
4 ft. iron bedstead, sacking bottom . . . . .	0	16	0
3 ft. dresser, 1 ft. 6 in. wide, with 2 drawers, potboard under, with 3 shelves over, with cut standards . . . . .	0	12	0
Inch sideboard each side of fireplace, one to slope as a desk with shelf under for books . . . . .	0	4	6
10 iron surplice hooks to fix at backs of doors; towel roller back of scullery door; copper lid . . . . .	0	4	6
	£5	0	0

It is to be noticed there are some manufactories in London and the country, where the casements and frames are provided complete, also the doors and frames, fully within the prices stated.

PLATE V.—Plans of double cottage with front elevation and perspective view, each containing two entrances, porch, lobby 4 × 3, living-room 11 × 9, scullery 9 × 6, pantry, bedroom 10 × 10, ditto 10 × 8.

*Estimated Bill of Quantities.*

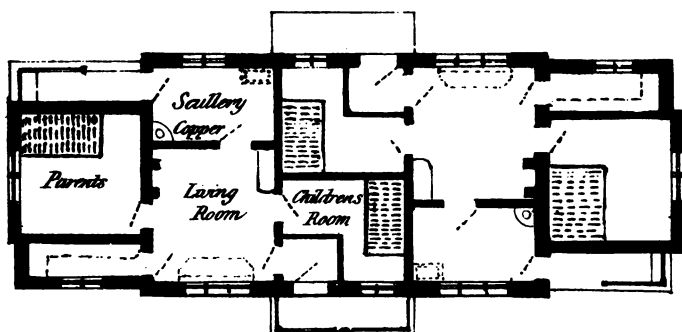
	£	s.	d.
358·0 cube concrete plinth and footings, at 2 <i>d.</i> . . . .	2	19	8
1100·0 super. 14-in. clay walls, at 2 <i>d.</i> . . . .	9	3	0
300·0 „ brick on edge partitions, at 2½ <i>d.</i> . . . .	3	2	6
112·0 „ 1½ brick chimneys, at 8 <i>d.</i> . . . .	3	14	8
20 ft. run of 8-in. pipe flue, at 8 <i>d.</i> . . . .	0	13	4
1456·0 super. asphalted roof on close board ditto, as before . . . . .	16	16	0
150·0 ft. run of zinc gutter, 16 ft. 2 in. of pipe, and 2 shoes . . . . .	2	15	4
775·0 super. of concrete floor, at 1 <i>d.</i> . . . .	3	4	7
2 steps to pantry . . . . .	0	4	0
66·0 yards of lay and set ceilings, at 1 <i>s.</i> 0½ <i>d.</i> . . . .	3	7	9
Carried forward . . . . .	£46	0	10



*Double 4 Roomed Cottage*



*Elevation.*



*Plan*

Cost £37.6.8.

Scale 1/16<sup>th</sup>



	£	s.	d.	£	s.	d.
Brought forward . . . . .				46	0	10
222·0 yards of lime white walls, at 1½d. . . . .				1	7	9
No. 10 weathered cement window sills . . . . .				0	5	0
6 1½-inch moulded sliding casements, with friction rollers top and bottom, and screw fastening in solid beaded fir frame 3½ by 2½ in., with weather and throated sill 7 by 2½ in., glazed with 20 oz. glass, stained and varnished . . . . .	6	0	0			
2 pairs of 1½ inch ditto, ditto, in solid frame, ditto . . . . .	2	0	0			
4 single ditto, hung with centre top and bottom, in solid frames . . . . .	2	12	0			
2 inch ledged door, grooved and beaded, iron-tongued, 2 screws to end of each ledge, hung with 20-inch garnets to solid rebated and beaded fir frame, two 6-in. rod bolts, Norfolk thumb latch, 10-in. stock lock to each door, with 2½ by 11 in. York stone sill, door and frame stained and varnished . . . . .	2	0	0			
10 ¾-inch ledged, rebated, and beaded doors, hung with 14-inch garnet hinges to rebated and beaded solid fir frames, thumb latches to living room and scullery, two 6-in. rod bolts to outer door, chamber latches with inside bolts to bed-rooms, stained and varnished, 2 by 9 in. York stone tiles . . . . .	6	12	0			
4 ¾-inch ditto, ditto, to pantry and children's bed rooms . . . . .	2	0	0			
224·0 super. ¾-in. match lining boards . . . . .	2	16	0			
60 ft. of 1-inch shelves to pantry, scullery, and bed-rooms . . . . .	0	15	0			
56 ft. of 3 by 1 in. boards to brick on edge partitions . . . . .	0	4	8			
				24	19	8
To post and rails to 4 porches . . . . .				2	0	0
				£74	13	3
	74	13	3			
Walls of compressed earth or concrete . . . . .	4	11	8			
				79	4	11
	74	13	3			
„ stud-framed and weather-boarded . . . . .	4	11	8			
				79	4	11
	74	13	3			
„ stone pebble, brick quoins to angles . . . . .	6	17	2			
				81	10	5



	£	s.	d.	£	s.	d.
	74	13	3			
Walls of 9-inch brick, built hollow . . . . .	13	15	0			
				88	8	3
	74	13	3			
„ 9-inch brick, built solid . . . . .	18	6	8			
				92	19	11
	74	13	3			
„ 14-inch stone rubble . . . . .	13	15	0			
				88	8	3
Roof with pantiles, add 3 <i>l.</i> 0 <i>s.</i> 8 <i>d.</i> ; with plain tiles, add 6 <i>l.</i> 1 <i>s.</i> 4 <i>d.</i>						
„ „ slates, add 12 <i>l.</i> 2 <i>s.</i> 8 <i>d.</i> ; with thatch, add 6 <i>l.</i> 1 <i>s.</i> 4 <i>d.</i>						

## FIXTURES TO EACH COTTAGE.

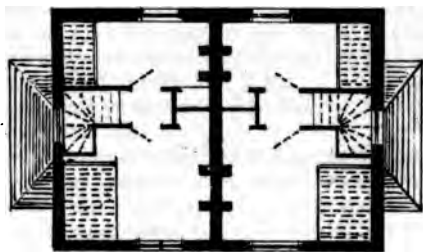
2 ft. 6 in. kitchen range, oven, boiler, set with air chamber, and ventilator grating to parents' bed room . . . . .	£	s.	d.
10-gallon boiler in scullery, and firework . . . . .	2	6	0
2 ft. stone ware sink, with trap and 3 in. drain pipe . . . . .	0	12	0
4 ft. iron bedstead and 3 ft. ditto . . . . .	0	7	0
3 ft. dresser with 2 drawers, potboard under, 3 shelves over . . . . .	1	4	6
1½-inch fall-down ironing-board table, with brackets, front of window . . . . .	0	10	6
10 iron surplice hooks to backs of doors . . . . .	0	7	6
Towel roller and copper lid . . . . .	0	2	0
	0	2	6
	£5	11	6

A great objection to wood floors, where there are children, is its absorption, more or less, of whatever is spilt upon it, causing afterwards noxious exhalations.

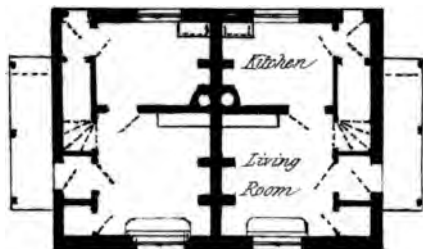
PLATE VI.—Plan, elevation, with perspective view of a double cottage, each containing, porch, entrance, lobbies 3 × 3, living-room 12 × 9 0, scullery 9 × 6, pantry 3 × 3 6, parents' bed-room 12 × 8 6, children's bed-room 12 × 6. Useful cottages to those having children of one sex.



*Perspective View*



*Chamber Plan.*



*Ground Plan.*  
*Double 4 Roomed Cottage.*



*Estimated Bill of Quantities.*

	£	s.	d.
266·0 cube ft. concrete footings and foundations, at 2 <i>d.</i>	2	8	8
1696·0 sup. ft. of 14 in. clay wall, at 2 <i>d.</i>	14	3	4
288·0 ditto 1½ brickwork, at 8 <i>d.</i>	9	12	0
112·9 ditto brick on edge partitions, at 2½ <i>d.</i>	1	3	1
40 ft. run of 8 in., 32 ft. of 7 in. socket pipe flue	2	0	0
616·0 sup. asphalted felt, laid on ½ close boards to rafters 3½ × 1½, with ceiling joists, as collars and wall plates, 3½ × 1½, at 3 <i>d.</i>	7	14	0
100·0 run of zinc eaves gutter, 32 ft. 2-inch down pipe, 2 shoes	3	8	0
408·0 sup. concrete ground floor, at 1 <i>d.</i>	1	16	0
400·0 sup. chamber floor plaster on lath or reeds, on wrought or chamfered joists, 7 × 2 pale drawn between, at 3 <i>d.</i>	5	0	0
2 brick steps to pantries	0	4	0
44 yards lath, lay set, to bed-room ceilings, at 1 <i>s.</i> 2 <i>d.</i>	2	11	4
190 yards of lime white walls, at 1½ <i>d.</i>	1	4	0
10 cement weatherings to windows outside, at 6 <i>d.</i>	0	5	0
8 pair 1½-inch moulded sliding casements, with friction rollers top and bottom, and screw fastening, in solid beaded fir frames 3½ × 2½, with weathered and throated sill 7 × 2½, glazed with 20-oz. glass, stained and varnished, at 20 <i>s.</i>	8	0	0
2 single casements hung on centres to solid frame, with fastening, glazed as above, &c.	1	6	0
Two 2-inch ledged doors, grooved and beaded, iron tong'd, 2 screws to ends of each ledge, hung with 20 in. garnets to solid rebated and beaded fir frame; two 6-in. rod bolts, Norfolk thumb latch, and 10 in. stock lock to each door, with 2½ × 11 York stone sill, door frames stained and varnished	2	0	0
10 ¾-inch ledged rebated and beaded doors, hung with 14 in. garnet hinges, in rebated and beaded solid fir frame, thumb latches to living and scullery rooms, chamber latches with inside bolts to bed-room, 2 in. York stone sills	3	15	0
4 ¾-inch ledge doors, rebated and beaded, hung with 12 in. garnet hinges to 1½ × 3½ beaded frames, iron buttons, 2 in. York stone sills, door frames stained and varnished	2	8	0
216·0 sup. ½ bead and rebated ledged inclosures to stairs and pantry, coal cellars and bed-rooms, stained and varnished	2	14	0
54·0 run of 3 × 1 to half brick on edge partitions	0	4	2
1½ chimney shelves to living room and bed-rooms	0	6	0
18 winders, 4 fliers to stairs, inch treads, ¾ risers, 3 × 3 octagon newels, 1 in. strings	2	2	0
Two rough porches	2	0	0
Carried forward	£76	2	6

	£	s.	d.	£	s.	d.
Brought forward . . . . .	76	2	6			
Walls built with compressed earth or concrete, add . . . . .	4	18	10			
	76	2	6	81	1	4
Ditto stud-framed and weather-boarded outside, add . . . . .	4	18	10			
	76	2	6	81	1	4
Ditto stone pebbles, brick quoins to angles, and round doors, and windows, add . . . . .	8	8	10			
	76	2	6	84	11	4
Ditto 9-inch brick, built hollow, add . . . . .	19	2	4			
	76	2	6	95	4	10
Ditto 9-inch ditto solid, add . . . . .	26	3	10			
	76	2	6	102	6	4
Ditto 14-inch stone rubble walls, add . . . . .	19	2	10			
				95	4	10

Roofs:—if covered with pantiles, add 1*l.* 17*s.* 6*d.*; plain tiles, add 3*l.* 15*s.*; slates, add 5*l.* 4*s.* 6*d.*; thatch, add 3*l.* 15*s.*

#### FITTINGS TO EACH COTTAGE.

	£	s.	d.
2 ft. 6 in. range, oven and boiler, set in brickwork . . . . .	2	0	0
14 in. grate to bed-room . . . . .	0	7	0
10 gall. boiler in scullery, with fire-box . . . . .	0	12	0
2 ft. stone ware sink, trapped, and 3 in. drain pipe . . . . .	0	7	0
4 ft. iron bedstead, and 3 ft. ditto . . . . .	1	4	6
3 ft. dresser, 2 drawers, footboard under, 3 shelves over . . . . .	0	10	6
10 iron surplice hooks to backs of doors . . . . .	0	2	0
1½ bracket table, ironing board under window . . . . .	0	7	6
Copper lid and towel roller to scullery . . . . .	0	2	6
	£5	13	0

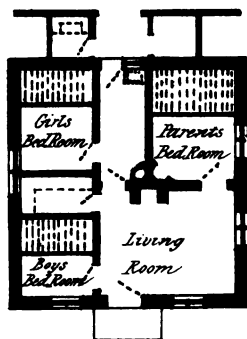
PLATE VII.—Plan with elevation of front and side of cottage, containing: front porch 8ft. × 4ft. living-room 11 × 9ft., scullery 9 × 3, parents' bed-room 9 × 7, girls' bed-room 8 × 6, boys' bed-room 6 × 6, pantry 6 × 4, fuel 4 × 4, tools 4 × 3, apiary 4 × 3, *necessaire* 4 × 4, although



*Side Elevation*



*Front Elevation*



*Plan.  
5 Roomed Cottage.*



shown is far best to be placed some 30 to 40ft. away from the house.

This cottage possesses all the advantages of a "Healthy Moral Home." It must be borne in mind all the rooms are reduced to the smallest size possible, so as to keep down the cost; having no inside lobby the porch is closed up four feet high to the front and one end, thus to keep out the wind. Parents' bedroom is distinct from the children's, the children's bed-room having the pantry between to keep them also distinct.

The floor of the living-room is twelve inches above the surface of the ground outside, forming a six inch step to floor of porch, with six inch step to floor of living-room. The floors to the three bed-rooms are upon the same level; floor to scullery six inches below, back porch six inches below scullery, floor to pantry eighteen inches below floor to living-room.

Height of rooms against the outer wall is seven feet, the other part of ceiling in the room nine feet high; ceiling to each bedroom to have panels of perforated zinc  $12 \times 10$ , thus leading the impure air into the space between ceiling and roof. Chimney shafts to all the cottages to be formed with a ventilating flue adjoining the living-room flue, about six inches square, into which the foul air is drawn through an air-brick  $9 \times 6$ , the same escaping outside the chimney under the projecting course above the roof.



*Estimated Bill of Quantities.*

	£	s.	d.
180·0 cube concrete footings and plinth, at 2 <i>d.</i>	1	6	8
480·0 sup. of clay wall, at 2 <i>d.</i>	3	19	0
108·0 ditto 1½ brick wall to chimney, at 8 <i>d.</i>	3	12	0
320·0 ditto 1½ bk. on edge, at 2½ <i>d.</i>	3	6	0
96·0 ditto ½ bk. flat, at 3 <i>d.</i>	1	4	0
10 ft. 8 in. flue, 20 ft. 7 in. do.	1	0	0
289 ft. sup. concrete floor, at 1 <i>d.</i>	1	4	1
Step to pantry	0	2	0
708 ft. sup. asphalted felt roof, on rafters as before, with collars or ceiling joists, and roof plates, at 3 <i>d.</i>	8	16	4
96 ft. run of metal gutter, and 7 ft. down pipe with shoe	1	15	6
32 yds. of lath, lay and set, at 1 <i>s.</i> 2 <i>d.</i>	1	17	4
124 ditto lime white walls, at 1½ <i>d.</i>	0	15	6
4 1½ moulded sliding casements, with runners top and bottom, and solid fir frame as before	4	0	0
1 1½ ditto, ditto, ditto	1	10	0
1 1½ ditto, to hang with stay bar and fastenings	0	10	0
1 Inch ledge door ditto as before, in solid fir frame, with fasten- ings and stone sill, as before	1	0	0
5 ¾ in. inside ditto ditto, and frames and sills as before	3	10	0
2 ¾ in. ditto ditto ditto	1	0	0
3 shelves to chimneys	0	5	0
40·0 run of inch shelves to pantry, scullery, &c.	0	10	0
36·0 ditto 3 × 1 bond to brick on edge partitions	0	3	0
Seat and rise to <i>necessaire</i>	0	11	6
Posts and rails to porch	0	10	0
	42	5	10
	42	5	10
Walls of compressed earth or concrete, add	2	9	7
	42	5	10
Ditto stone pebbles, with bricks to angles, add	3	14	4
	42	5	10
Ditto 9 in. brick wall, built hollow, add	7	8	9
	42	5	10
Ditto 9 in. brick wall, built solid, add	9	18	4
	42	5	10
Ditto 14 in. stone rubble wall, add	7	8	9
	49	14	7

20.

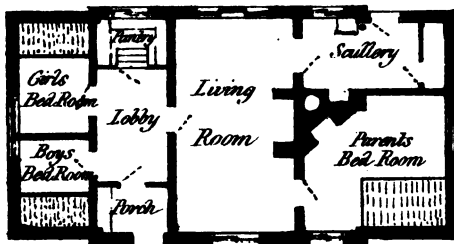
21.



*Front Elevation*



*Back Elevation*



*5 Roomed Cottage. Lobby & Porch.*

*Cost \$44,115.*

*Scale 1/4"*

Roof covered with pantiles, add 1*l.* 9*s.* 6*d.*; plain tiles, 2*l.* 19*s.*; slates, 5*l.* 18*s.*; thatch, 2*l.* 19*s.*

Wood floor joists, with sleepers, to be placed according to depth of joists, from 4 to 6 ft. apart, cost from 25*s.* per square of 100 ft.

The Frontispiece shows perspective view of this cottage plan of chimneys to this cottage to a  $\frac{1}{4}$  scale in Plate XXII.

## FITTINGS.

	£	s.	d.
2 ft. 6 in. kitchen range, with oven and boiler, set in brickwork	2	0	0
Two 14 in. grates	0	14	0
10 gall. boiler and fire-box	0	12	0
Stone ware sink, trapped, and pipe	0	7	0
One 4 ft. and two 3 ft. iron bedsteads	1	15	0
3 ft. dresser, shelves, and drawers	0	10	6
10 surplice hooks, 14 bracket table	0	7	6
Copper lid and towel roller	0	2	6
	6	8	6

PLATE VIII.—Plan, front and back elevation of a cottage with similar accommodation, but differently applied: open entrance lobby, interior do. 6 × 4, living room 14 × 10, parents' bed-room 10 × 8, scullery 10 × 6, including fuel store, girls' bed-room 8 × 6, boys' do. 6 × 6, pantry 5 × 4. Levels of these floors same as last; the ventilation also the same.

*Estimated Bill of Quantities.*

	£	s.	d.
175 ft. cube concrete footings and plinth, at 2 <i>d.</i>	1	9	0
700 ft. sup. of clay walls, at 2 <i>d.</i>	4	17	3
72 ft. ditto 1½ brick chimney, at 8 <i>d.</i>	2	8	0
400 ft. ditto ¼ brick on edge, at 2½ <i>d.</i>	4	11	8
10 ft. 8 in. flue pipe, 20 ft. 7 in. 2-inch air pipe	1	0	0
700 ft. sup. asphalted felt roof on close boards, rafters, ceiling joists, and wall plates, at 3 <i>d.</i>	8	15	10
96 ft. run of metal gutter, 7 ft. 2 in. pipe and shoe	1	15	6
	10	11	4
Carried forward	£24	17	8
	£	2	

	£	s.	d.	£	s.	d.
Brought forward . . . . .				24	17	3
419 ft. concrete floor . . . . .	1	14	0			
Brick step to pantry . . . . .	0	2	0			
46 yards lath, lay, set ceiling, at 1s. 6d. . . . .	3	9	0			
133 yards lime white walls . . . . .	0	16	0			
				6	1	0
4 1½ moulded sliding casements, with runners, in solid fir frames, as before . . . . .	4	0	0			
1 1½ ditto ditto ditto ditto . . . . .	1	10	0			
2 1½ ditto ditto ditto ditto . . . . .	1	0	0			
1 inch ledge door, with hinge and fastenings to solid fir frame as before . . . . .	1	0	0			
7 ¾ ledge door to inside room, at 12s. . . . .	4	4	0			
2 ¾ ditto ditto at 10s. . . . .	1	0	0			
3 shelves to chimneys . . . . .	0	5	0			
40 ft. run of 1-inch shelves . . . . .	0	10	0			
50 ft. 3 × 1 to form bond to half-brick wall . . . . .	0	4	2			
				13	13	2
				44	11	5
	£	s.	d.			
	44	11	5			
Walls of compressed earth or concrete . . . . .	2	8	7	47	0	0
				44	11	5
Ditto stone pebble with brick quoins . . . . .	3	12	10	48	4	3
				44	11	5
Ditto 9 in. brick wall, built hollow . . . . .	7	5	7	51	16	0
				44	11	5
Ditto 9 in. brick wall, built solid . . . . .	9	14	6	54	5	11
				44	11	5
Ditto 14 in. stone rubble . . . . .	7	5	7	51	16	0

If pantile roof, add 1*l.* 9*s.* 4*d.* ; if plain tiles, add 2*l.* 18*s.* 8*d.* ; if slate, add 3*l.* 16*s.* ; if thatch, add 2*l.* 18*s.* 8*d.*

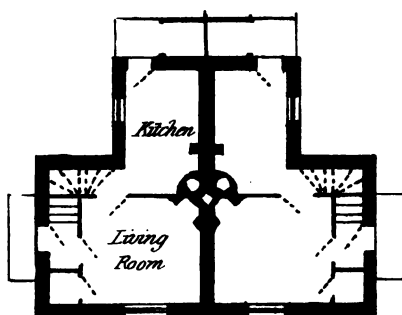
Fittings, as stoves, dresser, &c., as last, 6*l.* 8*s.* 6*d.*

PLATES IX, X.—Represent plan of the ground and bedroom floors. Front elevation with perspective view for a double cottage : living-room 9ft. 9 × 9ft. 0, scullery





*Front Elevation.*

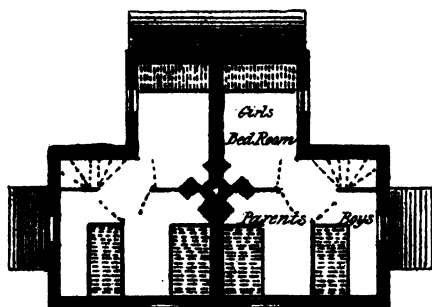


*Plan.*

*Double 5 Roomed Cottage Lobby & Porches.*

*Cost £36. 14. 9 each*

*Scale 1/16"*

*Side Elevation.**Plan.*

Cost of 2 Cottages £73.9.6

Scale 1/16"





11ft. 0 × 6ft. 0, entrance lobby 4ft. 0 × 2ft. 6, pantry 3ft. 0 × 2ft. 6, parents' bedroom 11ft. 0 × 6ft. 0, girls' bedroom 9ft. 0 × 7ft. 0, boys' bedroom, 8ft. 6 × 5ft. 0. Here the parents' bedroom with the position of bed, is kept distinct from the children's bedroom.

*Estimated Bill of Quantities.*

	£	s.	d.	£	s.	d.
280 ft. cube concrete footings and plinth . . . . .	2	6	0			
1428 ft. sup. clay wall . . . . .	11	18	0			
240 ft. sup. 1½ bk. chimney breast . . . . .	8	0	0			
40 ft. run of 8 in., 32 ft. run of 7 in., and 2 in. air-pipe . . . . .	2	0	0			
2 brick steps to pantry . . . . .	0	4	0			
				24	8	0
663 ft. sup. asphalted roof, close boarded, on wood rafters, ceiling, joists, and plates . . . . .	8	5	9			
80 ft. run of metal gutter, 32 ft. 2 in. down pipe, 2 shoes . . . . .	1	19	3			
				10	5	0
348 ft. sup. of concrete floor . . . . .	1	9	0			
348 ft. sup. of plaster floor on wood joists, pale drawn underneath . . . . .	4	7	0			
36 yards of lath, lay set ceilings . . . . .	2	2	0			
200 yards lime white walls . . . . .	1	5	0			
10 cement weathered sills . . . . .	0	6	0			
				9	9	0
8 1½ sliding casements, in solid frame, as before . . . . .	8	0	0			
2 Ditto ditto ditto . . . . .	3	0	0			
2 Inch ledge door, solid frames, &c., as before . . . . .	2	0	0			
10 ¾ ditto ditto ditto . . . . .	7	4	0			
2 ¾ ditto ditto ditto . . . . .	1	0	0			
238'0 sup. ¾ match lining boards . . . . .	3	19	4			
2 stairs complete . . . . .	2	1	8			
6 shelves to chimneys . . . . .	0	9	0			
50 ft. 1-inch shelves to pantry, scullery, and bedrooms . . . . .	0	12	6			
2 porches . . . . .	1	10	0			
				29	16	6
				£73	18	6

	£	s.	d.	£	s.	d.
	73	18	6			
Walls built with concrete or rammed earth, add .	5	19	0			
				79	17	6
	73	18	6			
Ditto stone pebbles and brick quoins, add	8	18	6			
				82	17	0
	73	18	6			
Ditto 9 inch brick wall, built hollow, add	17	17	0			
				91	15	6
	73	18	6			
Ditto 9 inch brick wall, built solid, add	23	16	0			
				97	14	6
	73	18	6			
Ditto stone rubble walls, add .	17	17	0			
				91	15	6

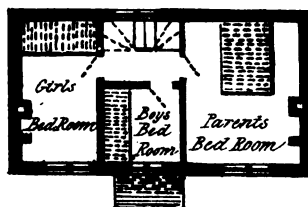
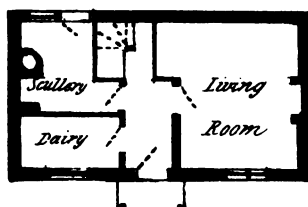
If pantiles to roof, add 1*l.* 7*s.* 6*d.* ; if plain tiles, add 2*l.* 15*s.* 3*d.* ; if slates, add 5*l.* 10*s.* 6*d.* ; if thatch, add 2*l.* 15*s.* 3*d.*

If pantiles or slate, add 14*s.* for metal valleys.

#### TO FITTINGS TO EACH COTTAGE.

	£	s.	d.
2 ft. 6 in. range, oven, and boiler, set in brickwork . . . . .	2	0	0
Two 14 in. grates, set in bed-rooms . . . . .	0	14	0
10 gallon boiler, with fire-box, to scullery . . . . .	0	12	0
Stone ware trapped sink, with drain pipe from ditto . . . . .	0	7	0
4 ft. iron bedstead, and 2 3-ft. ditto . . . . .	1	15	6
3 ft. dresser, with 2 drawers, 3 shelves and standards over, and pot-board under . . . . .	0	10	6
16 iron surplice hooks, towel roller, and copper lid . . . . .	0	4	6
	6	3	6

PLATE XI.—Ground and bedroom plan, with elevation of cottage, with the following accommodation,—Ground floor, outside porch, lobby 9 × 4, living-room 12 × 9, with recess for dresser, scullery 7ft. 6 × 6ft. 0, pantry 8 × 4, coal-cellar under the stairs; chamber floor, parents' bedroom 12 × 9, girls' bedroom 12 × 6, boys' do. 6 × 6. This is a comfortable "Healthy Moral Cottage" for an agricultural labourer,

*Front Elevation.**6 Roomed Cottage Lobby  
& Porch.*



and it is only by the greatest economy in the choice and by the use of materials that it can be built, to enable it to be let for a moderate rent so as to yield a fair interest as an investment. Also well adapted for an artisan at an increased rent.

*Estimated Bill of Quantities.*

	£	s.	d.	£	s.	d.
133·0 cube concrete footings and plinth . . . . .	1	2	2			
808·6 sup. of clay wall . . . . .	6	14	8			
168·0 sup. 1½ brick wall chimneys . . . . .	5	12	0			
300·0 sup. ½ bk. on edge . . . . .	2	14	0			
Stone step to pantry . . . . .	0	2	0			
20 ft. run of 8 in., 50 ft. run of 7 in. flue, and 2 in. air-pipe . . . . .	1	5	0			
				17	9	10
616·0 sup. asphalted roof, close boarded . . . . .	7	14	0			
48·0 run of metal gutter, 30 ft. 2-inch pipe, 2 shoes . . . . .	1	7	0			
				9	1	0
32 yards lath, lay and set, ceilings . . . . .	1	17	4			
133 yards of lime white . . . . .	0	16	1			
7 cement weathered sills . . . . .	0	3	6			
				2	16	11
288·0 sup. concrete floor . . . . .	1	2	4			
288·0 sup. plaster floor, wrought joists, &c. . . . .	3	7	0			
				4	9	4
6 1½ moulded sliding casements, as before . . . . .	6	0	0			
1 Ditto ditto ditto . . . . .	1	0	0			
1 Inch ledge outside door, &c., same as before . . . . .	1	0	0			
7 ¾ ditto ditto ditto . . . . .	3	0	0			
1 ¾ ditto ditto ditto . . . . .	1	0	0			
Stairs and strings and rail . . . . .	1	0	0			
4 chimney shelves . . . . .	0	6	0			
40 ft. 1-inch shelves to pantry, scullery, &c. . . . .	0	10	0			
50·0 sup. ½ match lining to stairs, &c. . . . .	0	16	8			
54·0 run of 3 x 1 . . . . .	0	4	6			
1 rough outside porch . . . . .	0	10	0			
				15	7	2
				49	4	3

	£	s.	d.	£	s.	d.
	49	4	3			
Walls of concrete or rammed earth, add . . . . .	3	7	4	52	11	7
	49	4	3			
Ditto stone pebbles and brick quoins, add . . . . .	5	6	9	54	11	0
	49	4	3			
Ditto 9 in. brick, built hollow, add . . . . .	10	2	0	59	6	3
	49	4	3			
Ditto 9 in. brick, built solid, add . . . . .	13	9	0	62	13	3
	49	4	3			
Ditto 14 in. stone rubble, add . . . . .	10	2	0	59	6	3
Pantile roof, add 1 <i>l.</i> 5 <i>s.</i> 8 <i>d.</i> ; plain tiles, add 2 <i>l.</i> 11 <i>s.</i> 4 <i>d.</i> ; slate, add 5 <i>l.</i> 2 <i>s.</i> 8 <i>d.</i> ; thatch, add 2 <i>l.</i> 11 <i>s.</i> 4 <i>d.</i>						
Fittings, stoves, bedsteads, &c., as before, 6 <i>l.</i> 3 <i>s.</i> 6 <i>d.</i>						

*Statement of the Requisites of Cottage Architecture, by the  
late J. O. Loudon, Esq., published in 1831.*

The essential requisites of a comfortable labourer's cottage may be thus summed up:—

1. The cottage should be placed alongside a public road, as being more cheerful than a solitary situation, and in order that the cottager may enjoy the applause of the public, when he has his garden in good order and keeping.

2. The cottage should be so placed, that the sun may shine on every side of it every day throughout the year, when he is visible; for this reason, the front of the cottage can only be parallel to the public road in the case of roads in the direction of North East, South West, North West, and South East; in all other cases the front must be placed obliquely to the road, which as we have previously shown,

is greatly preferable to having the front parallel to the road.

3. Every cottage ought to have the floor elevated, that it may be dry; the walls double, or hollow, or battened, or not less than eighteen inches thick, that they may retain heat, with a course of slate, or flagstone, or tiles bedded in cement six inches above the surface, to prevent the rising of damp; the roof thick or double, for the sake of warmth, and projecting eighteen inches or two feet at the eaves, in order to keep the walls dry, and to check the radiation of heat from their exterior surface.

4. In general every cottage ought to be two stories high, so that the sleeping rooms may not be on the ground floor, and the ground floor ought to be from six inches to one foot above the outer surface.

5. The minimum of accommodation ought to be a kitchen or living-room, a back kitchen or wash-house, and a pantry, on the ground floor, with three bed-rooms over; or two rooms and a wash-house on the ground floor, and two bed-rooms over.

6. Every cottage, including its garden, yard, &c., ought to occupy not less than one sixth of an acre, and the garden ought to surround the cottage, or at all events to extend both before and behind. In general there ought to be a front garden and a back yard, the latter being entered from the back kitchen, and containing a privy, liquid manure tank, place for dust and ashes, and place for fuel.

7. If practicable, every cottage ought to stand singly and surrounded by its garden, or, at all events not more than two cottages ought to be joined together. Among other important arguments in favour of this arrangement, it may be



mentioned, that it is the only one by which the sun can shine every day on every side of the cottage. When cottages are joined together in a row, unless the row is in a diagonal direction with reference to a South and North line, the sun will shine chiefly on one side. By having cottages singly or in pairs, they may always be placed along any road in such a manner that the sun may shine on every side of them, provided the point be given up of having the front parallel with the road; a point, which, in our opinion, ought not for a moment to be put in competition with the advantage of an equal diffusion of sunshine.

8. Every cottage ought to have an entrance porch for containing the labourer's tools, and into which, if possible, the stairs ought to open, in order that the bed-rooms may be communicated with, without passing through the front or back kitchen. This, in the case of sickness, is very desirable; also in the case of deaths, as the remains may be carried down stairs while the family are in the front room.

9. The door to the front kitchen or best room should open from the porch, and not from the back kitchen, which as it contains the working utensils and washing apparatus, can never be fit for being passed through by a stranger, or even the master of the family where proper regard is had by the mistress to cleanliness and delicacy.

10. When there is not a supply of clear water from a spring adjoining the cottage, or from some other efficient source, then there ought to be a well or tank partly under the floor of the back kitchen supplied from the roof, with a pump in the back kitchen for drawing it up for use, as hereafter described in detail. The advantages of having the tank or well under the back kitchen, are, that it will be

secure from frost, and that the labour of carrying water will be avoided.

11. The privy should always be separated from the dwelling, unless it is a proper water-closet, with a soil-pipe communicating with a distant liquid manure tank or cess-pool. When detached, the privy should be over or adjoining a liquid manure tank, in which a straight tube from the bottom of the basin ought to terminate, by which means the soil basin may always be kept clean by pouring down the common slops of the house. No surface being left from which smell could arise, except that of the area of the pipe, the double flap to be hereafter described will prevent the escape of the evaporation from this small surface, and also insure a clean and dry seat.

12. The situation of the liquid manure tank should be as far as possible from that of the filtered water tank, or clear water well; it should be covered by an air-tight cover of flagstone and have a narrow well adjoining, into which the liquid should filter through a grating, so as to be pumped up or taken away without grosser impurities, and in this state applied to the soil about growing crops.

13. In general, proprietors ought not to intrust the erection of labourers' cottages on their estates to the farmers, as it is entirely owing to this practice that so many wretched hovels exist in the best cultivated districts of Scotland and in Northumberland.

14. No landed proprietor, as we think, ought to charge more for the land on which cottages are built than he would receive for it from a farmer, if let as part of a farm, and no more rent ought to be charged for the cost of building the cottage and inclosing the garden than the

same sum. would yield if invested in land, or, at all events, not more than can be obtained by Government securities.

15. Most of these conditions are laid down on the supposition that the intended builder of the cottage is actuated more by feelings of human sympathy than by a desire to make money, and hence they are addressed to the wealthy, and especially to the proprietors of land and extensive manufactories or mines.

The above propositions, to be carried out in their full integrity, so as to yield a fair interest for the outlay, could only be provided in isolated positions, where the wages of Agricultural Labourers were equal to that of Town Labourers receiving from 18 to 20 shillings per week, and who would be willing to pay for a good home, 2s. 6d. per week as rent.

#### *A Plea for Pretty Cottages.*

Rural Cottages may be classed into two kinds, the pleasant and the repulsive. It is not alone upon the extent and character of the accommodation within that a dwelling is attractive, but this depends in some measure upon external appearance and upon accessories, which to the casual observer appear unimportant. So closely is agreeableness in a dwelling connected with situation, convenience of access, privacy, and healthfulness, that taste in design and extent of accommodation cannot compensate for the absence of these conditions; but to render a cottage desirable as a residence as well as suitable for a labourer and his family, other adventitious circumstances require to be kept in view. There are other accessories which tend to heighten the enjoyment

of the inmates of the cottage, and not the least of these is a pleasant garden.

The enjoyment derived from viewing beautiful objects does not imply the possession of wealth or of a cultivated taste. The ploughman and his family may possess taste, and a just appreciation of the beautiful, as much as those surrounded with elegance and luxury; if the taste is dormant—if he sees no charms in the works of nature, to cultivate his taste is a duty enforced by the neglect to which the rural labourer has been subjected. If happiness is not present in the cottage, it will be sought elsewhere. When the character of the dwellings of the rural labourers is considered, it will be seen that most of these are bleak and dreary as residences. There is little or nothing about them attractive to the indwellers. To an onlooker many of these cottages convey impressions of wretchedness and desolation. There are districts, particularly in the Highlands, where the rural labourer is worse lodged in his cottage than the “Red Indian in his Wigwam.”

In 1814 Mr. Thos. D. W. Deaarn, Architect of Cranbourn, in Kent, sent to the Repertory of Arts “Hints on Cottage Building;” and, in 1820, published it, dedicated to the Marquis Camden.

Believing the same to be not generally known induces us to draw particular attention to it. Bricks being free of duty, the adoption possesses features of general use.

The object proposed was to reconcile “economy and durability” in the construction of dwellings for the labouring poor.

In the construction of buildings of this class cheapness and durability are necessary; for, unless these can be recon-

ciled, the poor will either want cottages or they must put up with those of the most flimsy construction, and such as are barely sufficient to preserve them from the inclemency of the weather.

Cottages for the labouring poor should be so constructed as to be little liable to injury.

It is desirable that the habitations of the poor, consistent with their comfort and our obligations to them (for those who are placed in a superior situation are certainly under obligation to those of this class) should be *cheap, durable, and healthy*.

This method of building walls hollow with the common bricks  $9 \times 4\frac{1}{2} \times 3$  is, beyond all doubt, the best method in the use of bricks for cottages, with a still greater advantage with half-bricks as stretchers.

Fig. 1, Plate XII., shows part of an elevation constructed with common bricks. It is of first-rate importance. All the bricks should be well formed, square, and all of one *size*. The footings should be either concrete or two bricks wide, and the plinth, or foundation-wall, should be twelve inches thick. They will require sufficient bricks  $12 \times 4\frac{1}{2} \times 3$  for headers. This wall will be built in the old English manner, consisting of alternate courses of *headers and stretchers*. The next above is a stretching course *on edge*; and the backing or inside course is the same, leaving an interval between of *three* inches. These are then covered with a heading course laid flat; so follow on to the finished height.

Fig. 2 is the section of the wall, showing the hollow space in the same; describing more clearly its construction.

Fig. 3. Plan on the upper course of foundation plinth, showing the manner of bonding the angles.



FIG: 4

*Elevation with Door & Window*

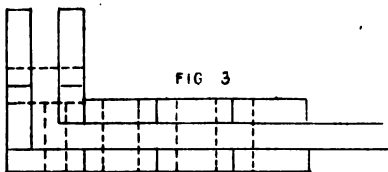


FIG 3

*Plan of Angle*

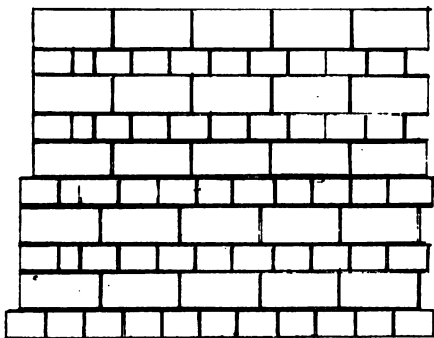


FIG. 1

*Elevation*

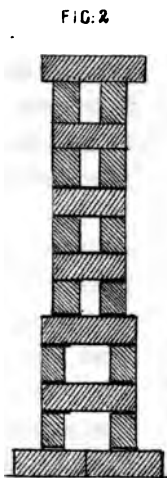


FIG: 2

*Section*



Fig. 4. Elevation, showing door and window. To prevent the labour and waste by cutting bricks, some headers should be prepared by the brickmaker for doors and windows; also some bricks three inches square for the arches over the doors and windows.

Building walls thus produce a saving of one-third of bricks, with one-half of mortar; labour about the same; with the advantage of freedom from damp. A careful workman will produce a fair face to both sides of the wall. A coat of lime-white inside will be preferable to that of rendering in mortar.

Estimate of one square of walling built hollow, and lime-whited:—

	£	s.	d.
750 bricks at 20s. per 1000 . . . . .	0	15	0
Labour, say . . . . .	0	5	0
Mortar . . . . .	0	1	8
Lime-white . . . . .	0	0	6
	1	2	2

By some it may be considered that the brick in edge course looks unsightly—a defect of not much account, if the cottage possess other more important advantages, as freedom from damp, strength, facilities for ventilation, with considerable saving in cost.

A variation can be adopted to meet the desire of appearance by having the stretchers half-bricks, the bricks being divided longitudinally. This is accomplished by drawing a knife or other sharp instrument about half through them while in a state between wet and dry, and after they are burned, a slight stroke of the trowel on the reverse will divide them as required. Adopting these bricks the wall



will have all the courses three inches in height instead of being, as in the preceding method, alternately three and four-and-a-half inches.

The work may either be carried up in the old English manner; that is, a course of all headers, and then a course of stretchers, or in Flemish bond, consisting of alternate headers and stretchers in each course; as the air may be made to circulate freely through the walls both ways.

The object aimed at is to render the external walls, whether of cottages or more important buildings, *dry and durable*, consistent with economy.

With respect to the first, it must be evident that walls thus constructed, even in the most exposed situations, are not liable to become damp from any ordinary cause; for, though every other course is carried through the wall (admitting it to be only nine inches thick), yet a vacuum is not only left longitudinally through each stretching course above and below, but also between the heading courses, the vertical joints being left open at least three inches in length in the interior of the wall, so as to allow the air to circulate freely *throughout*.

#### *A few Remarks on Building Pisé, or Earthen Walls.*

The earth proper for this work should be neither sand nor clay, but partaking of both. Clay is particularly objectionable. Common red gravel, such as is found in numerous districts, is excellent—to be used in its natural state as it is dug without screening, or it is equally good when screened; but in all this kind of work, except in cases where the walls are two feet and upwards in thickness, no stones should

be left in it larger than ducks' eggs, and these should be kept to the middle of the wall, as the work is carried up course by course.

Ballast or shingle mixed with sand or chalk.

Chalk alone will do of itself.

Calcareous limestone, and the like road scrapings.

Primitive, or secondary limestones, and the like road scrapings; or lime grout previously mixed, and not wet.

All the above will cohere and continue to solidify, and, with the exception of the chalk, will have strong tendency to concretion by means of the small portion of lime which is to be incorporated with them, and, of course, becomes very durable. The bolder and coarser the sort of earth the better. When used it should retain no more moisture than just to make it adhere together under the pressure of the thumb and finger. Notwithstanding earths bordering on sand appear to make the strongest work, nevertheless good earths may be found in parts that do not abound with sand. Those that abound with a mixture of grit and fine gravel are generally the best.

Having provided proper earth, as much should be put in each layer as to form about an inch and a half when compressed by ramming.

The materials to be used should neither be too wet nor too dry, but similar to the state they are dug up in; for water prevents compression, if more than damp, and, if too dry, that will not do for the contrary reason, as the stuff will not then cohere at all.

All the preparation required, in case of using any of the silicious earth, is to mix very equally, and intimately, from one-fifth to one-tenth part of good lime in powder—say,

from one to two bushels of ground stone-lime to every five or ten bushels of gravel ; but where any calcareous limestone is used this is unnecessary, and the same of the like road scrapings. Where the primitive or secondary limestone is used with similar road scrapings mixed with it, no lime or sand is required to be grouted or previously incorporated.

Small pieces of oak, or larch board, or red pine, about three or four feet long, two inches thick, by four or eight inches wide, will be occasionally required to lay in the middle of the walls at each of the angles ; but not to project through, and should be laid alternately right and left about eighteen inches rise one above the other.

PLATE XIII.—Shows portion of wall built, with the frame fixed over for a continuation of the work ; these frames or caissons are provided as follows, for walls either fourteen or sixteen inches thick. The perspective view of the frame shows how it is fixed to build the angle of a building.

The mould consists of two long planks, (see Fig. 1) 12 ft. long for the outside and two shorter ones for the inside, each twenty inches broad, and one inch and a quarter thick each plank ; each strengthened by ledges screwed across them at about two feet six inches from centre to centre ; holes are made through these pieces at top and bottom, to receive the bolts which hold the boards parallel to each other, fourteen or sixteen inches asunder, or the thickness of the wall intended to be formed between them ; iron plates with holes in them are screwed on to prevent the holes wearing with the bolts. The bolts have a large head at one end, and a key passes through the other to keep the plates together. When a wall is to be built, the foundation is laid in brick or stone work, or of concrete, which is carried nine or twelve inches

Fig. 2.

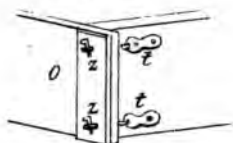


Fig. 3.

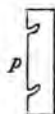
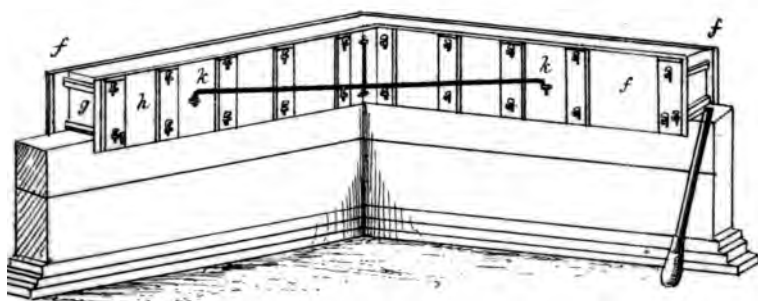
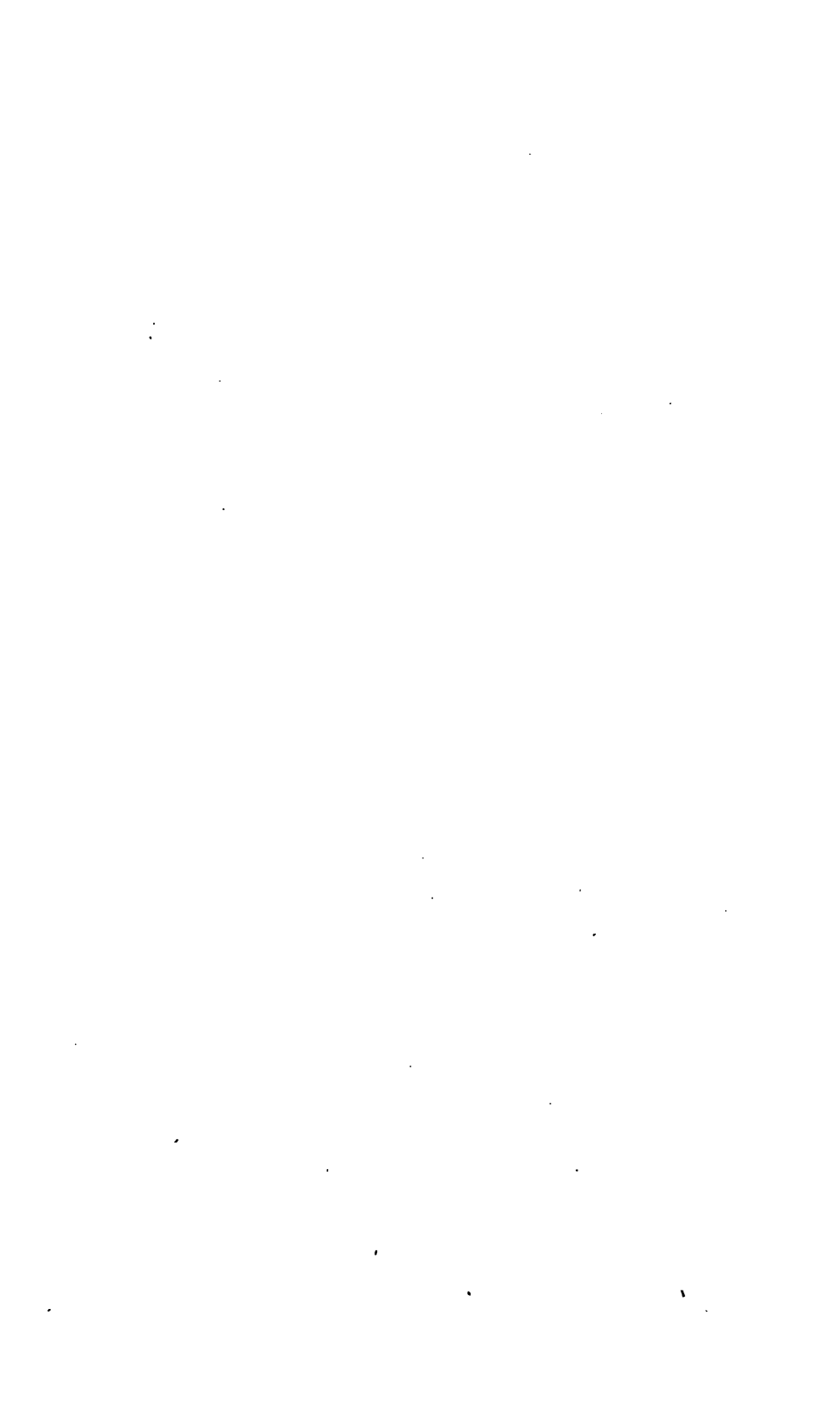


Fig. 1.

*Method of Building Pise or Earthen Walls.*



above the ground ; upon this foundation the planks are placed and bolted together ; two boards like that shown at *a* are placed between the planks at the ends, to form the ends of the moulds, then boards are placed between the two bolts which are seen close together at the ends of the mould, and are held fast by that means ; the earth has now to be rammed in between the moulds.

When the gravel is well mixed, lay a course about the thickness of a brick on the wall, and with the foot move all the larger stones to the middle line of the wall and regulate the whole pretty even at the surface ; then walk and tread it down from end to end ; next begin to ram it well, but moderately, as too heavy blows will not do half so well as oft repeated moderate blows. Keep ramming close to the boards, as well as the centre line, and mind the angles of the rammer do not cut the boards, and *increase the force as the stuff hardens.*

As soon as the rammer ceases to sink or make any further impression by heavy blows, lay on another course and proceed as before until brought up to top of boards, then take out the keys from the bolts, and draw out the bolts ; the planks are then removed, and put together again, the bolts at the end being put through the holes left in the wall ; only one of the end boards is now put in, and the ramming proceeds as before ; in this manner straight walls may be built of any length, and when the lower course is finished, then the mould may be taken to pieces and put together again upon the course, the lower bolts of the frame being put through the bolt holes which the upper bolts made in the wall at the first operation, to insure that the upper part of the wall is in the same place, and exactly over the lower.

When a wall is to be built thinner than usual, a block of wood must be placed under the head of each bolt, or extra key holes, so as to diminish the space between the planks.

When the angle walls of buildings are to be made, the apparatus is put together as shown in the Plate : four of the planks are put together to form a right-angled mould, one end of each of the planks *F* and *H* is furnished with double bolts, the other ends at the internal angle have each two eyebolts fixed into them, as shown separately at *b, d* ; then a bolt *n* connects the two moulds, so as to form a hinge, the planks are kept together, so as to be perpendicular to each other, by a long iron rod *K*, hooked into eyebolts fixed in the planks. The outside planks of the mould are joined together in a different manner (see Fig. 2), that of one frame being longer than that of the other, and the two holes through its end *o*, to receive the bolts *t t*, which are fastened to the ends of the other shorter plank, and the keys are put through the ends of the bolts to secure the planks together ; a piece of wood *P* is occasionally placed between the end of the short plank and the side of the other, to increase the space between the planks, to make a thicker wall, the two bolts at the end of the plank being received into the notches in the piece of wood, and these bolts are then put through the hole *z z* of the long plank. In building the angle wall, it is necessary that the vertical joints formed between each mould should not be over one another, but arranged in the same manner as the joints of brickwork ; this is accomplished by making the lower course of wall upon the brickwork only half the length of the mould, which is done by placing the end board *G* of the mould in the middle of it :

the next course over this is to be made the whole length of the mould, the next one only half, and so on.

The mould should be planed smooth inside, and, if desirous that the surfaces of the work should look well, the inside of them must not be injured.

The frames should be made of  $1\frac{1}{4}$ -inch deal, ploughed and iron-tongued to each other. The bolts and pins, or keys, of iron, as are also the plates on the holes in the sides of the frame. These plates are put to prevent the keys from cutting into the wood, and the holes from gulling and wearing.

This sort of mould is calculated for making walls from nine inches to twenty-four inches in thickness.

When employed for straight walls, or making good between the corners of buildings, the two returns of the frame are used in pairs; *ff* and *fh* make two sets of frames. The boards marked *g* must be of length equal to the thickness of the wall to be made, and are for the purpose of stopping the earth, and making ends or jambs to doors or windows, or wherever wanted.

The piece of wood (*p*) is two inches thick, and is for the purpose of making out the external sides of the moulds, from a fourteen-inch to a sixteen-inch wall. By introducing this piece between the two sills (*ff*), and putting the fixed iron-pins in the outer holes (*z z*), and taking away the blocks under the heads of the outer bolts, the sides of the frames will then be sixteen inches asunder, and thereby adapted for a sixteen-inch wall. Fig. *E* shows pieces of wood about one-and-a-half inch square, cut to the length of the thickness of wall, and are for gauges to be applied on top of the bolt to keep the keys from drawing the sides too close to each other.



In beginning the first layer of wall, some of them will be required at the bottom, the more firmly to support the frame on the brick or stone work. They are then worked into the wall, and, after the frame is taken down, drove out. After the first course they are only necessary to the top irons, and may be taken out as soon as the earth is rammed up near them, so that no holes are left in the upper course of the wall more than the bolt-hole.

When these frames are used, one side is placed in such a direction that the front board may be required to be taken away, and then, by means of the angular iron brace (κ), the other return is sure to stand at right angles with the first. Care should then be taken in the first course to set the sides level; that being done, and plumbed upright, the other upper courses, from the nature of the frame, and manner of using them, must, of course, come upright and level, and a wall being properly begun cannot well get wrong. After the first course of a building is done, the mould should be moved to another, and so on till all the courses are up; and as the top holes of each preceding course become the bottom holes in the succeeding ones, no difficulty will be found in fixing the mould after the first course is properly done. Fig. 3 shows the iron-pin and staple that keep the internal angle of the frame together. κ, fig. 4, an iron stay to set the returns at right angles. This is only wanted where other means of setting the building square are not to be obtained.

Having described the frame and means of applying it generally, it may be necessary to observe the following particulars in the process:—Having carried one course round the building, it frequently happens that the top thereof becomes too dry to attach to the next succeeding course,

and, therefore, it is advisable that, as soon as the frame is set for the succeeding course, a small quantity of thick grout, composed of one-fifth lime and four-fifths earth, be poured on top of each course immediately before the first layer of earth is put in. A very small quantity is sufficient, and will add much to the strength of the work by cementing the courses well together at the joints. The workman should also, with the corner of his rammer, in ramming home to the upright joints, cut down a little of that part of the wall up to which he works. This will make the upright joints key together, and unite in a solid manner. Having thus proceeded and got up the wall, the next thing will be to stop the bolt-holes with mortar made of one-fourth lime and three-fourths earth—the same as the wall.

The rammer (x) should be about three feet six inches or four feet long, of any sound wood four inches square at the butt end, and tapering to fit the hand; the lower end to be capped with a piece of cast-iron screwed in the sides, with screw-holes countersunk.

If it be desirable to have a superior face to the wall externally, in making the walls about three inches in thickness of loose earth should be put in each course, which done, the same, by means of a trowel made for the purpose, is drawn back and cleared from the face of the wall, and the space then filled up with the facing composition, forming about an inch in thickness. The whole then is firmly rammed (on which, and properly preparing the facing, much depends the perfection of the faced work) till it is quite hard, when it will be compressed to about one-and-a-half inch in thickness. The common facing stuff is composed of lime one part, and earth, same as used for walling, three parts.

The lime and earth mixed and slaked together the same as for mortar. The more it is slaked and wetted the better, provided time can be allowed for it again to dry and pulverise, so as to be fit for ramming. The better sort of facing stuff may have a small quantity more of lime in it.

The proper season for performing this work is any time that the earth can be procured sufficiently dry for the purpose. The more early in the season the better, in order to give it time to dry before finishing, or it would be advisable not to finish till the year after it is built.

It is a *sine quâ non* that earth-wall buildings stand on a plinth footing or foundation. Whether brick, ashlar, flint, rubble stone, or concrete, should be carried up one foot above the surface of the ground, so as to keep them dry from both drip and soakage water.

When the walls are finished they should be covered by a projecting roof, and defended from all gutter water and leaky spouts.

If garden walls, they may be coped or thatched, and on good foundations will last nearly, if not equal to stone, and, if built with good concrete, will surpass stone in its lasting qualities, as is shown in the remains of works done in Great Britain by the Romans.

They are as superior to the Devonshire cob-walls or the eastern counties clay walls as silver is to copper, or as gold to copper, if done in concrete.

These walls may be plastered on either side, and coloured to any tint, and when desired to be plastered, the sooner the better ; for these walls dry very quickly, and will carry any weight immediately. They are very warm in winter, and cool in summer.

By standing up against the inside frame pieces of wood to project about two inches, slots or grooves can be left in the walls for brick on edge or brick flat partition walls. Fix in the window and door frames so as to build in the walls brick arches in two or more half-bricks; rims can be carried from the reveals inside and out. Bed on with mortar  $2 \times 4$  wood plates, and build joints in as the works proceed. Chimney-breast requires a few bricks as high as the gullet or throat of the flue: after which, a square or circular case, tapering very little to allow for draught, keeping the widest end upwards, will form a flue of any required size. These must be perfected as the work proceeds, or provide nine-inch red or stone ware pipes.

For common cottages, when the whole of the walls are up and covered in, the holes should be stopped with very coarse mortar made the same as the facing stuff, but used wetter, and the wall then lime-washed over with lime and sharp sand, which should be made up in small quantities and used while hot. This may readily be done by adding a knob of lime and sand a little at a time as it is used.

For better kinds of cottages the better sort of facing stuff may be used, and then, as before, the whole limewhited, or if it be required to make the finishing as perfect as possible, the following is the true mode, viz.: with water and a brush thoroughly wet and soak the face of the wall for two or three yards in superficies at a time, all which part during the said wetting should be continually rubbed and worked about with a hand float, till such time as the face is rubbed smooth and even, by which the facing composition will so wash up as to become a pleasant colour, the face smooth and hard when dry, and not liable to scale off as a coat of

plaster would do. This finishing would be still improved by a small quantity of lime being put in the water used for soaking the face, and if, after the wall is well soaked and rubbed, as above mentioned, there be thrown thereon with a brush some of the lime and sand, (such as used for lime-whiting,) and then also worked into the face, the face will then become as perfect and hard as stucco.

Unlike concrete great care must be observed to see that the workmen compress the earth well, as the stability of the wall depends upon this being well done.

In most places those walls can be constructed at a cost of 3*d.* per foot super., or 2*s.* 3*d.* per yard, or 4*s.* per rod of 16 feet, or 25*s.* per square of 100 feet, or 3*l.* 9*s.* 6*d.* per rod of 272 feet.

Specimens of houses built in 1800 in this kind of work may be seen at Henley Hill, near Barnet, Herts.

### *Descriptive Details of the component parts of a Cottage.*

#### DOORS.

DOOR, noun substantive, (ðop, ðupe, Saxon; *dorris*, Erse.)

"The gate of a house; that which opens to yield entrance. *Door* is used of houses, and gates of cities or publick buildings; except in the licence of poetry."—*Dr. S. Johnson*.

"All the castle quaked from the ground,  
And every *door* of free will open flew."

*Fairy Queen.*

"In the side a *door*  
Contrived; and of provisions laid in large,  
For man and beast."

*Milton's Paradise Lost.*

"To the same end men several paths may tread,  
As many *doors* unto one temple lead."

*Denham.*

"For without rules there can be no art, any more than there can be a house without a *door* to conduct you in."—*Dryden*.

"In familiar language, a house; often in the plural, *doors*."—*Dr. S. Johnson*.

"Lay one piece of flesh or fish in the open air, and another of the same kind and bigness within *doors*."—*Bacon's Natural History*.

"Let him doubt whether his cloathes be warm, and so go naked; whether his house be firm, and live without *doors*."—*Decay of Piety*.

"Martin's office is now the second *door* in the street, where he will see Parnell."—*Arbutnot*.

"Lambs, though they are bred within *doors*, and never saw the action of their own species, push at those who approach them with their fore-heads."—*Addison's Spectator*.

DOORCASE, noun substantive, (*door and case*.)

"The frame in which the door is enclosed."—*Dr. S. Johnson*.

"The making of frames for *doorcases* is the framing of two pieces of wood athwart two other pieces."—*Mixon*.

The most useful doors for Agricultural Labourers' Cottages are for external doors, inch ledge doors from yellow dram batters, grooved and iron tongued beaded joints, with either 3 or 4 inch ledges, each ledge to have two  $1\frac{1}{2}$  screws at each end; the minimum size of doors 6ft-6 high by 2ft-7 wide, hung with 18-in. Garnet hinges to proper rebated and beaded solid fir frame, or door case 4 x 3. Two 6-in. iron rod bolts, Norfolk thumb latch, with 10-in. wood stock-lock as fastenings.  $2\frac{1}{2}$  by 11 York stone sill. Cost of the same, say from 20s.

Inside door  $\frac{3}{4}$  inch ledge grooved and iron tongued or rebated with  $\frac{3}{4}$  ledges as before, minimum size 6ft-6 by 2ft-6, hung with 12-in. Garnet hinges, to proper rebated and beaded solid fir frames  $3\frac{1}{2} \times 2\frac{1}{2}$ . Thumb latch for the common door on the ground floor, those to the bed-rooms

will require latches with inside bolts attached. Cost, say about from 12s.

It is sometimes desirable to have the outside back door in two heights, so that the upper half may occasionally be open; this adds to the cost: doors to pantry, coal store, *necessaire*, &c. Size, 6ft 6 × 2ft. Cost from 10s. each.

### WINDOWS.

WINDOW, noun substantive, (*windiu*, Danish; Skinner thinks it originally *wind-door*.)

"An aperture in a building by which air and light are intermitted."—*Dr. S. Johnson*.

"Being one day at my *window* all alone,  
Many strange things happened me to see."  
*Spenser*.

"A fair view her *window* yields,  
The town, the river, and the fields."  
*Waller*.

"When you leave the *windows* open for air, leave books on the *window* seat, that they may get air too."—*Swift*.

"He through a little *window* cast his sight,  
Though thick of bars that gave a scanty light."  
*Dryden*.

"The frame of glass or any other materials that cover the aperture."—*Dr. S. Johnson*.

"To Thee I do commend my watchful soul  
Ere I let fall the *windows* of mine eyes :  
Sleeping or waking, oh defend me still !"  
*Shakespeare's Richard III*.

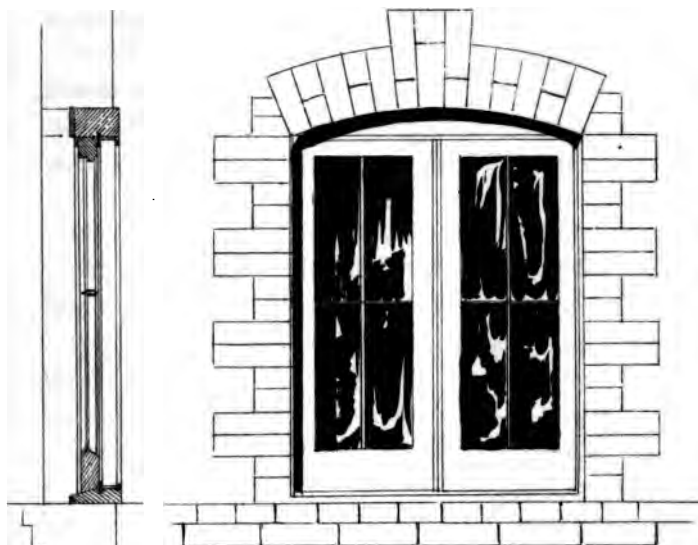
"In the sun's light, let into my darkened chamber through a small round hole in my *window*-shutter, at about ten or twelve feet from the *window*, I placed a lens."—*Newton's Optics*.

"Between these half columns above, the whole room was *windowed* around."—*Wotton's Architecture*.

"With pert flat eyes she *windowed* well its head ;  
A brain of feathers, and a heart of lead."  
*Pope's Dunciad*.





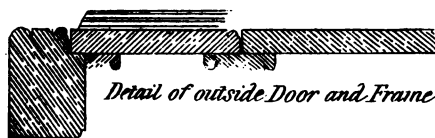


*Elevation: 1/2 in. Scale*

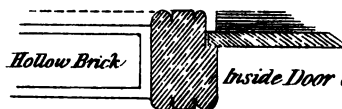
*Section*



*Plan*



*Detail of outside Door and Frame: 1 1/2 in. Scale*



*Hollow Brick*

*Inside Door & Frame: 1 1/2 in. Scale.*

The most useful size of windows for "Agricultural Labourer's Cottages," the minimum size, say 3ft. wide, and 4ft-6 high or 4ft-6 wide by 4ft-6 high, the first in two compartments, one of them either to slide on runners or hinged to open outwards, the last for two portions to slide on runners or hinged to open outwards, the sashes to be 2ins. thick glazed with 20-ounce glass in solid fir frames,  $5 \times 2\frac{1}{2}$  sill weathered and throated at a cost price from 20s. per frame. PLATE XIV.

## STAIRS.

STAIR, noun substantive, (*stægen*, Saxon, *steghe*, Dutch.)

"Steps by which we rise in ascent from the lower part of a building to the upper. Stair was anciently used for the whole order of steps; but *stair* now, if it be used at all, signifies, as in *Milton*, only one flight of steps."—*Dr. S. Johnson*.

"A good builder to a high tower will not make his *stair* upright, but winding almost the full compass about, that the steepness be the more insensible."—*Sidney*.

"How many cowards, whose hearts are all as false  
As *stairs* of sand, wear yet upon their chins  
The beards of Hercules and frowning Mars."

*Shakespeare.*

"I would have one only good room above *stairs* of some forty feet high."  
*Bacon.*

"Sir James Tyrrell repairing to the Tower by night, attended by two servants, stood at the *stair* foot, and sent there two villains to execute the murder."—*Bacon.*

"Satan now on the lower *stair*,  
That scaled by steps of gold to heaven gate,  
Looks down with wonder at the sudden view  
Of all the world."

*Milton's Paradise Lost.*

"The *stairs* were such as whereon Jacob saw  
Angels ascending and descending."

*Milton's Paradise Lost.*

**STAIRCASE**, noun substantive, (*stair and case*.)

"The part of the fabrick that contains the *stairs*."—*Dr. S. Johnson*.

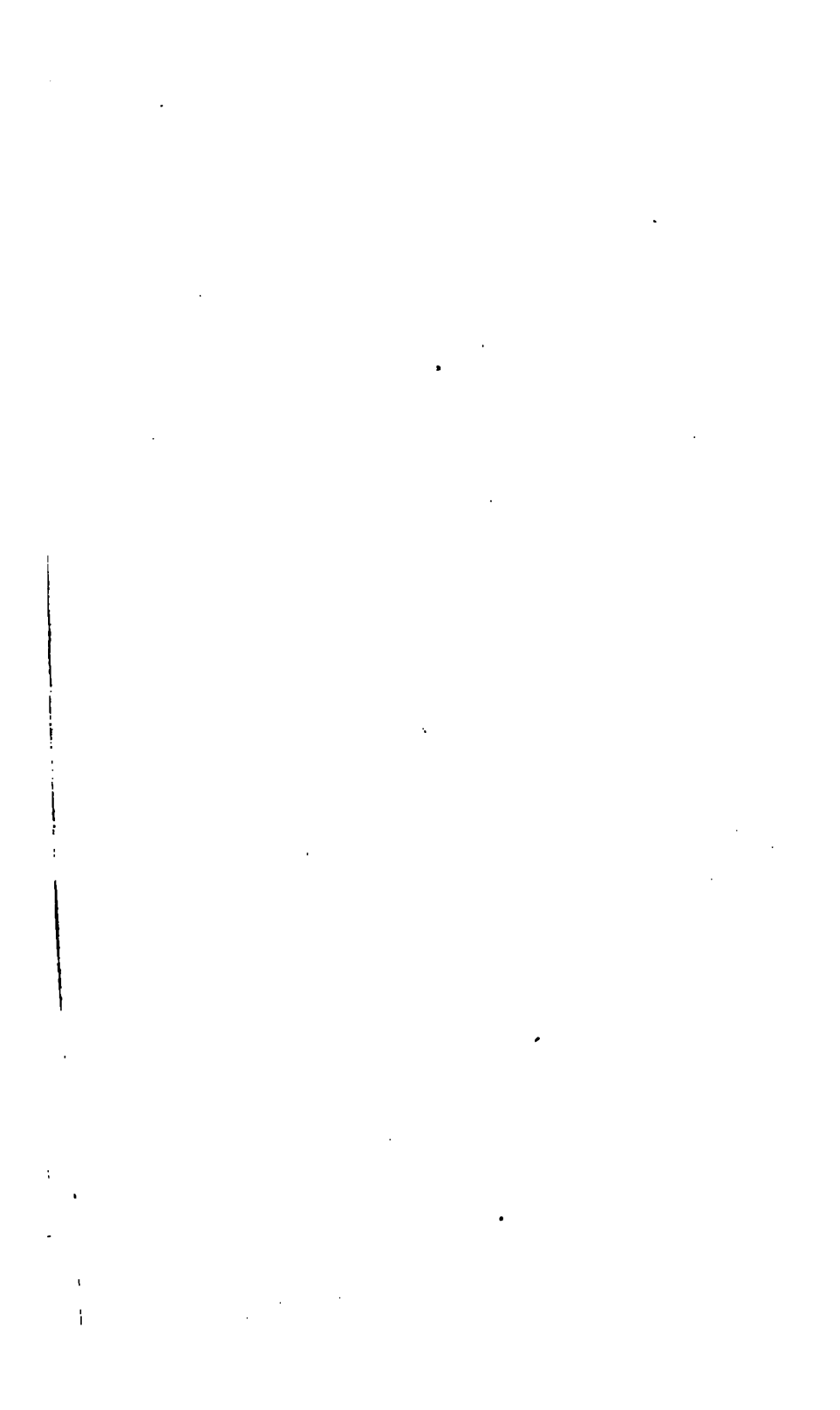
"To make a complete *staircase* is a curious piece of architecture."—*Wotton*.

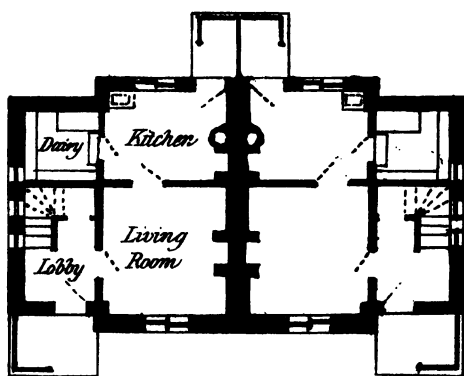
"I cannot forbear mentioning a *staircase*, where the easiness of the ascent, the disposition of the flights, and the convenient landing, are admirably contrived."—*Addison on Italy*.

Stairs for agricultural labourers' cottages are mostly provided of wood, viz.: inch treads,  $\frac{2}{3}$  riser housed into inch close and inch wall strings, framed, square, octagon, or turned newels,  $\frac{1}{2}$  inch capping,  $\frac{7}{8}$  square baluster with  $2\frac{1}{2}$  rail steps composed of flyers and winders, at a cost of 1s. 6d. per step.

It has been a matter of great surprise to us that no fire-proof stairs have been provided at a cost to supersede those of wood: it is no credit to the stoneware manufacturers that they have not produced such an article suitable for the agricultural labourer's cottage; and that owners of slate quarries have not provided the same, as it does not require a fine material: their attention has been drawn to the importance of a fire-proof stair, constructed with detail drawings, showing how readily it could be provided; as yet they have evinced no desire to provide such, no doubt considering it would not yield them sufficient remuneration, but from the large number that would be required they labour under a great mistake. An apparent difficulty arises as to the fixing in regard to handrail; this is remedied by having all the steps winders. The treads and riser in stone-ware could be provided from 2s. per step, and in slate from 3s. per step.

Some years since, Chance Brothers, the glass manufacturers, had an idea of introducing a material of great

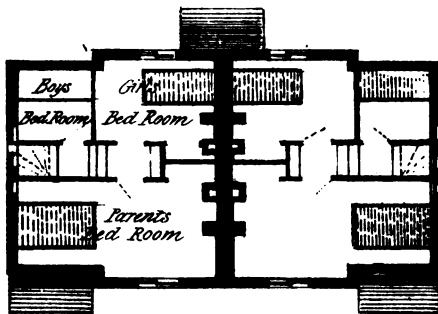




*Double 6 Roomed Cottage*

Cost £43.10.0 each

Scale 1/16"



Plan of Chamber Floor.



Section.



Plan of Joists to Chamber Floor

Plan of Timbers to Roof

Double 6 Roomed Cottage

Cost \$87.00 the two Cottages

Scale 1/16"



hardness from their works at Oldbury ; this we believe would have met the want.

PLATE XV., XVI.—Double cottage.—Plan of ground and bed-room floor, front elevation, plan of floor, joist and plan of timbers of roof and section.

Accommodation to each cottage outside front porch, entrance lobby and stairs 9ft. 6 × 6ft., living-room 10ft. 6 × 10ft., scullery or back kitchen 10ft. × 7ft. 6, pantry or dairy 6ft. × 6ft., parents' bed-room 16ft. × 8ft., girls' bed-room 10ft. × 7ft. 6, boys' bed-room 6ft. × 6ft.

Here the principle is well carried out, the privacy of the parents' bed-room by the position of the stairs. Altogether a well disposed comfortable cottage suitable for an intelligent family.

*Estimated Bill of Quantities.*

	£	s.	d.
168'0 cube concrete . . . . .	1	8	0
1116'0 sup. clay wall . . . . .	9	5	0
350'0 sup. 1½ brick chimney . . . . .	11	13	0
586'0 sup. ½ brick on edge partitions . . . . .	6	2	5
40 ft. run of 8 in. flue, 96 ft. run of 7 in. ditto, and 3 in. air pipe . . . . .	3	0	0
2 steps to pantry . . . . .	0	4	0
	31 12 5		
748 ft. sup. asphalted felt, on close boarded roof, with rafters, ceiling joists, and plates . . . . .	9	7	0
110 ft. run of metal gutter, 32 ft. 2-inch pipe, 2 shoes . . . . .	1	6	0
	10 13 0		
525 ft. sup. concrete floor . . . . .	2	3	9
60 yards of lath, lay set ceiling . . . . .	3	10	6
198 yards of lime white walls . . . . .	1	4	6
525 ft. sup. plaster floor, joists, pale drawn . . . . .	6	11	3
20 cement sills, weathered . . . . .	0	10	0
	14 0 0		
Carried forward . . . . .	£56	5	5



	£	s.	d.	£	s.	d.
Brought forward . . . . .				56	5	5
8 1½ sliding casements, and solid frames, as before . . . . .	8	0	0			
10 1½ ditto ditto . . . . .	5	0	0			
2 1 in. ledge door, solid frame, as before . . . . .	2	0	0			
12 ¾ ditto ditto . . . . .	7	4	0			
4 ¾ ditto ditto . . . . .	2	0	0			
2 stairs complete . . . . .	2	0	0			
8 shelves to chimneys . . . . .	0	12	0			
60 ft. sup. ¾ match linings . . . . .	1	0	0			
40 ft. run of 1 in. shelves . . . . .	0	10	0			
40 ft. run 3 × 1 to ½ brick partitions . . . . .	0	5	0			
4 porches . . . . .	2	3	7			
				30	14	7

£87 0 0

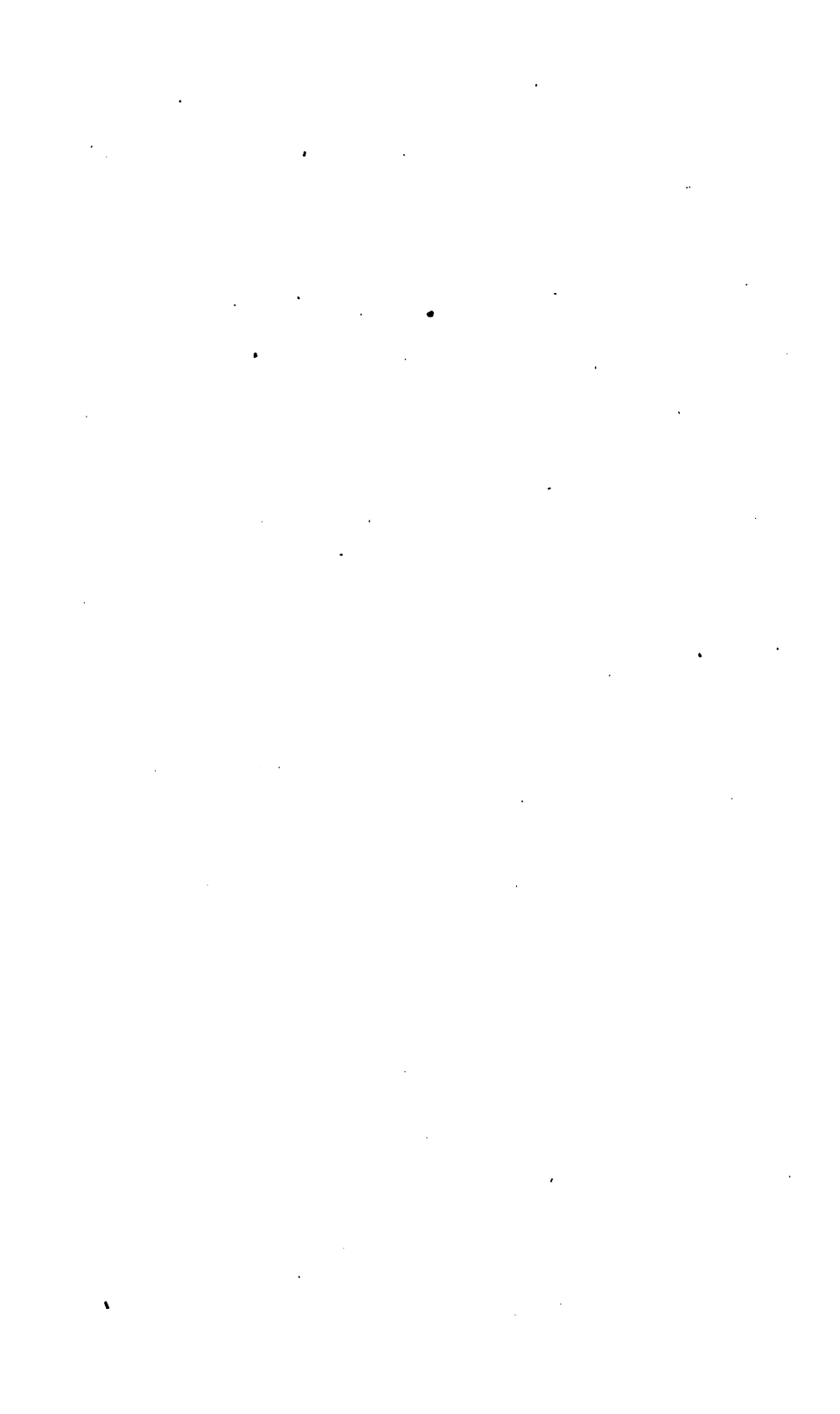
	87	0	0			
Walls of compressed earth or concrete, add . . . . .	4	12	6			
				91	12	6
	87	0	0			
Ditto stone pebble, with brick quoins, add . . . . .	6	18	9			
				93	18	9
	87	0	0			
Ditto 9 in. brick, built hollow, add . . . . .	13	17	6			
				100	14	2
	87	0	0			
Ditto 9 in. ditto, built solid, add . . . . .	18	10	0			
				105	6	8
	87	0	0			
Ditto 14 in. stone rubble, add . . . . .	13	17	6			
				100	14	2

If pantiles to roof, add 1*l.* 11*s.* 2*d.*; plain tiles, add 3*l.* 2*s.* 4*d.*; slates, add 6*l.* 4*s.* 8*d.*; thatch, add 3*l.* 2*s.* 4*d.*

Fittings to each cottage, 6*l.* 17*s.* 6*d.*

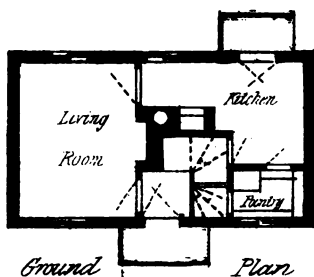
PLATE XVII.—Design for a single cottage consisting of plan of Ground-floor, plan of bed-room floor. Front elevation.

Accommodation—Front and back porches: entrance-lobby, 4-0 × 5-0; living-room 12-6 × 10; scullery or back-





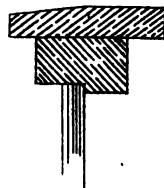
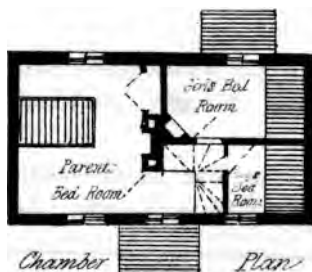
*Elevation*



*6 Roomed Cottage*



*Chimney above Roof*



*Dwarf Enclosure to Porch*

*Cost £15. 70 11*

*Scale 1/16"*

kitchen, 12-0 x 8; pantry, 6-0 x 6-0; coal place under stairs from scullery; stairs and landing; parents' bed-room, 12-6 x 10-0; girls' bed-room, 11-6 x 6-0; boys' ditto, 6-0 x 6-0.

This cottage in appearance is good—front and back elevations nearly alike, therefore its appearance at any point is pleasing; when built in brick, by having the plinth, the string, and sill course, with the external quoins, and round doors and windows of a different coloured brick from the other portions, adds much picturesque effect: this cottage would warrant a superior labourer as tenant, at a rental of at least 2s. 6d. weekly.

*Estimated Bill of Quantities.*

	£	s.	d.	£	s.	d.
147 ft. cube concrete foundations and footings . . . . .	0	12	3			
756 ft. super. of clay walls . . . . .	6	6	0			
204 ft. super. of 1½ brick walls . . . . .	6	17	8			
154 ft. super. of ½ brick on edge partition . . . . .	1	12	2			
40 ft. run of 8-inch flue, 20 ft. of 7-inch, with 3-inch air pipe . . . . .	2	0	0			
Steps to dairy . . . . .	0	2	0			
				17	10	1
468 ft. super. asphalted felt room, on close boards, rafters, ceiling joists and plates . . . . .	7	2	0			
80 ft. run of metal gutter, 14 ft. pipe and shoe . . . . .	1	13	0			
				8	15	0
275 ft. super. of concrete floor . . . . .	1	2	11			
265-ft. super. of plaster floor on joists 7 x 2, wrought and chamfered, pale drawn . . . . .	3	6	3			
30½ yds. of lath, lay and set ceilings . . . . .	1	15	7			
122 yds. of lime white walls . . . . .	0	15	3			
No. 9. cement weathered sills . . . . .	0	4	6			
				7	4	6
Carried forward . . . . .	£33	9	7			

	£	s.	d.	£	s.	d.
Brought forward . . . . .				33	9	7
9 pair of 1½ sliding casements in solid frames, glazed . . . . .	9	0	0			
1 inch ledged outside door, in solid frame, &c. . . . .	1	0	0			
6 ¾-inch ditto doors in frames . . . . .	3	12	0			
2 ¾-inch ditto dairy and coal place . . . . .	1	0	0			
4 shelves to chimneys, 40 ft. inch shelf, 40 ft. 3 × 1 bond . . . . .	0	19	4			
Stairs complete . . . . .	1	0	0			
2 rough sapling porches . . . . .	1	10	0			
				18	1	4
				51	10	11
				51	10	11
Walls of concrete or compressed earth, add . . . . .	3	3	0			
				54	13	11
				51	10	11
„ stone pebbles, brick quoins, add . . . . .	4	14	6			
				56	5	5
				51	10	11
„ 9-inch brick, built hollow, add . . . . .	9	9	0			
				60	19	11
				51	10	11
„ 9-inch ditto solid, add . . . . .	12	12	0			
				64	2	11
				51	10	11
„ stone rubble, add . . . . .	9	9	0			
				60	19	11

If pantiles to roof, add 17s. 6d.; plain tiles, add 17. 9s. 3d.; slates, 27. 18s. 6d.; thatch, 17. 9s. 3d.

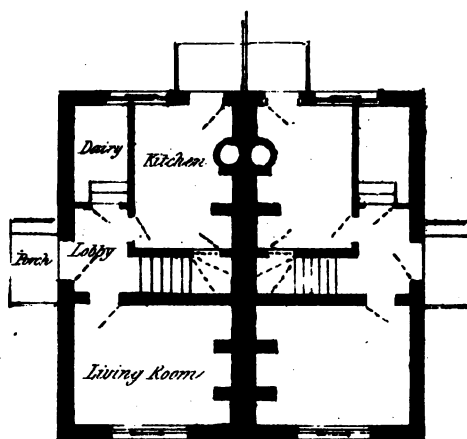
Fittings as before, 67. 17s. 6d.

PLATES XVIII., XIX.—Double Cottage.—Plan of ground-floor, front elevation, plan of chamber-floor and entrance elevation. Accommodation on the ground-floor provides entrance-lobby, 7-6 × 4-6; living-room, 12-6 × 10; scullery, 12-0 × 8-0; pantry, 8-0 × 4-6; stairs with landing; chamber-floor provides parents' bed-room, 12-6 × 10-0;





*Front Elevation*



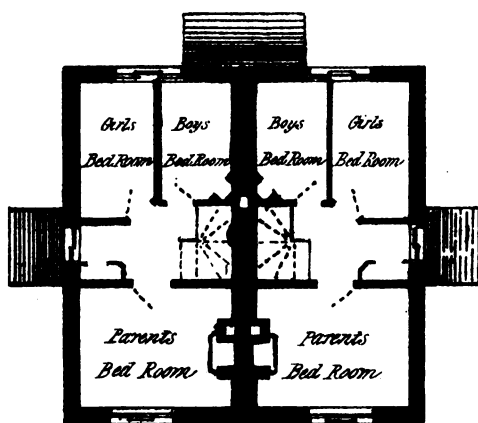
*Plan of Ground Floor  
Double 5 Roomed Cottage, Lobby & Porches.*

*Cost £100-15-9*

*Scale 1/16"*



*Side Elevation.*



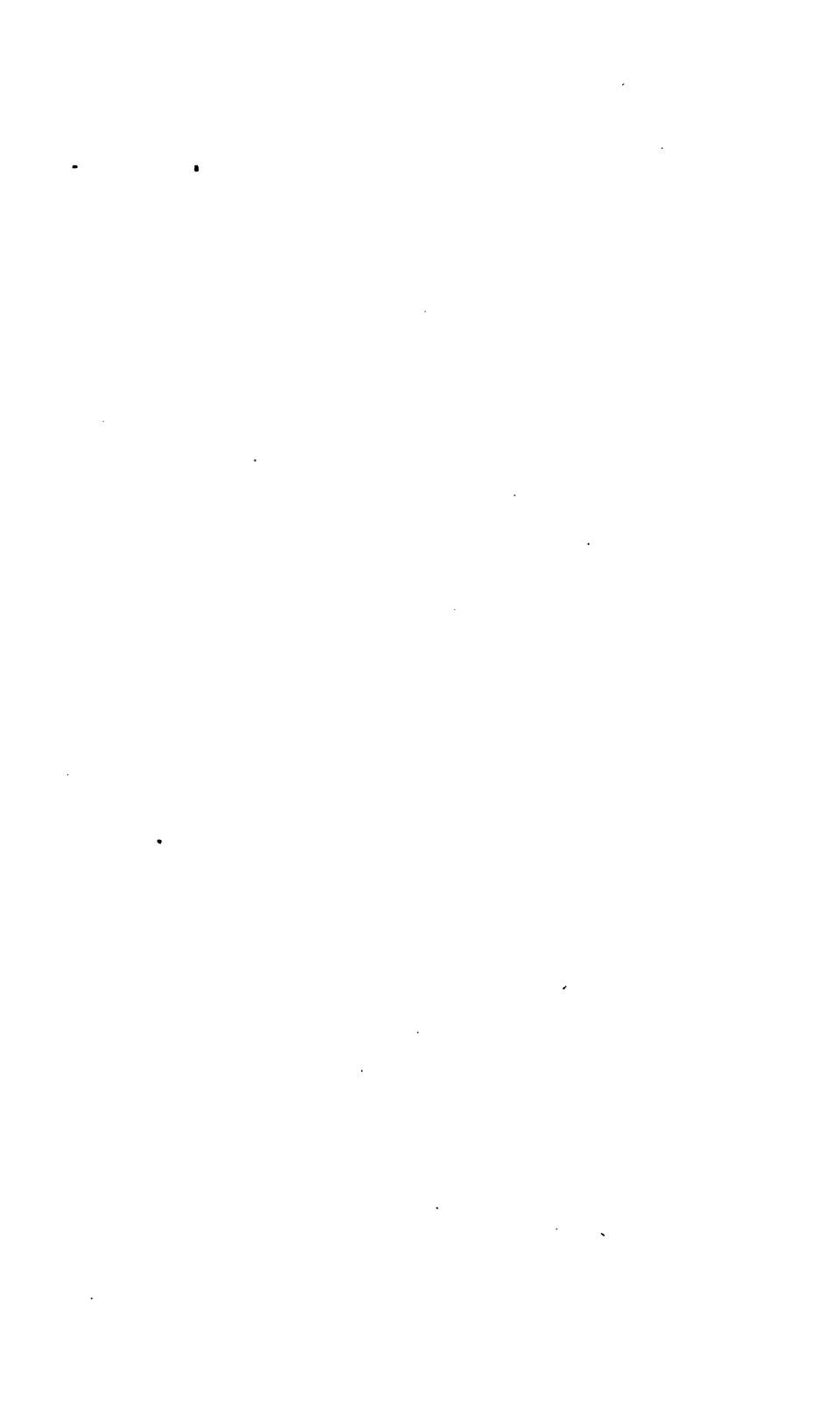
*Chamber Plan.*

*Double 5 Roomed Cottage*

Cost of 2 Cottages \$100.15.9

Scale 7/16" = 1'





*Estimated Bill of Quantities.*

	£	s.	d.	£	s.	d.
229 ft. cube concrete foundations . . . . .	0	19	1			
1674 ft. super. clay walls . . . . .	13	19	0			
448 ft. super. 1½ brick wall chimneys . . . . .	15	12	0			
390 ft. super. ½ brick on edge partitions . . . . .	4	1	3			
40 ft. run. of 8-inch, 40 ft. of 7-inch, 52 ft. of 6-inch flue, 8-inch air pipes . . . . .	3	10	0			
2 steps to dairies . . . . .	0	4	0			
				38	5	4
960 ft. super. asphalted roof, on close boards, rafter ceiling, joists and plates . . . . .	12	0	0			
120 ft. run of metal gutter, 28 ft. of pipe, 2 shoes . . . . .	2	14	0			
				14	14	0
620 ft. super. concrete floor . . . . .	2	11	8			
600 ft. super. plaster floor, wood joists, pale drawn under . . . . .	7	10	0			
70 yards lath, lay and set ceilings . . . . .	4	1	8			
270 yards of lime white walls . . . . .	1	13	9			
No. 10. cement weathered sills . . . . .	0	7	0			
				16	4	1
8 solid fir framed windows, with sliding casements, three to each frame, glazed . . . . .	12	0	0			
2 pair of 1½ sliding casements, in solid frames as above . . . . .	2	0	0			
2 stairs, with treads and risers complete . . . . .	2	0	0			
2 1-inch ledged doors in solid fir frames, with fasten- ings complete, and stone sill . . . . .	2	0	0			
12 ¾-inch ditto to rooms . . . . .	7	4	0			
4 ¾-inch ditto to dairies, &c. . . . .	2	0	0			
8 shelves to chimneys, 80 ft. 1-inch shelves, 100 ft. 3 x 1 bond . . . . .	2	0	4			
4 rough porches . . . . .	2	8	0			
				31	12	4
				100	15	9

	£ s. d.	£ s. d.
	100 15 9	
If concrete or rammed earth walls, add . . .	6 19 6	107 15 3
	100 15 9	
Stone pebble with brick quoins, add . . .	10 9 3	111 5 0
	100 15 9	
9-in. brick walls, built hollow, add . . .	20 18 6	121 14 3
	100 15 9	
9-in. brick walls, built solid, add . . .	27 18 0	128 13 9
	100 15 9	
14-in. stone rubble wall, add . . .	13 19 0	114 14 9

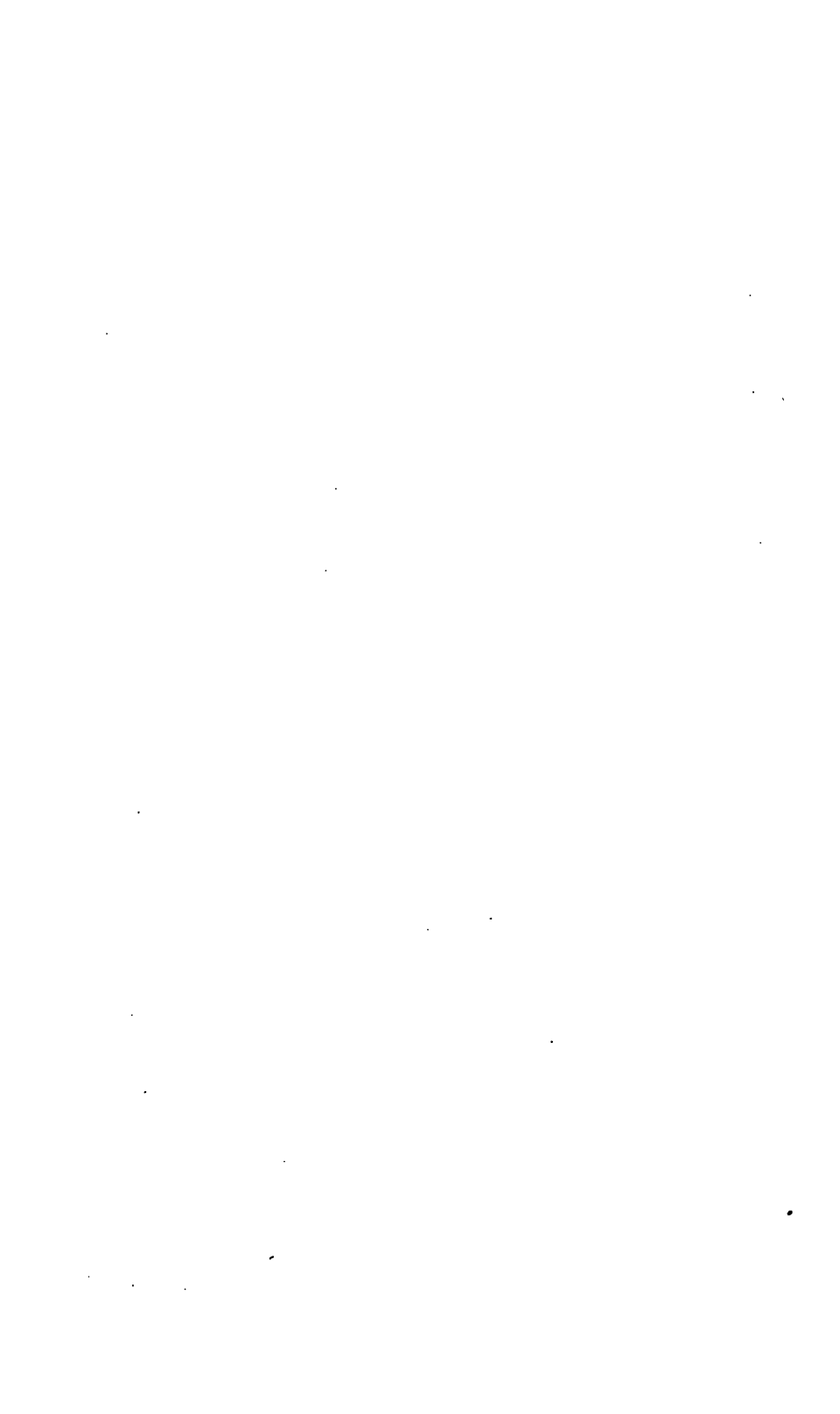
If pantiles to roof, add 2*l.*; plain tiles, add 4*l.*; if slates, add 8*l.*; if thatch, add 4*l.*

Fittings as before for one cottage, 6*l.* 17*s.* 6*d.*

PLATES XX., XXI.—Single five-room cottage.—Ground-plan with front elevation and bed-room plan with end elevation.

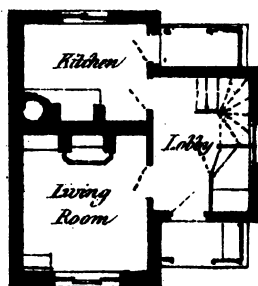
Accommodation, two porches; entrance-lobby, 10-0 × 4-0; living-room, 11-0 × 9-0; scullery or kitchen, 9-0 × 7-0; pantry, 5-0 × 4-0; stairs and landing; parents' bed-room, 11-0 × 9; girls' bed-room, 9-0 × 7-0; boys' bed-room 6-0 × 6-0.

This plan meets all social and moral wants forming the nucleus for a very useful cottage, suitable for a first-class Agricultural Labourer or Artisan, and by additional size to the rooms, with a scullery abutting on kitchen, and conservatory on living-room, receiving its warmth from kitchen-fire, the present back-porch, a dairy: forms a very comfortable cottage for a Tradesman.





*Front Elevation*

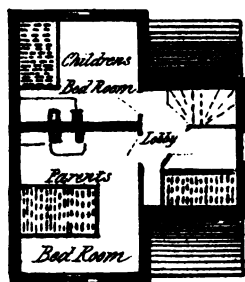


*Plan*

*5 Roomed Cottage*

*Cost £50.17.1*

*Scale 1/16"*



Chamber Plan.



*Estimated Bill of Quantities.*

	£	s.	d.	£	s.	d.
168 ft. cube concrete footings and plinth . . . . .	0	14	0			
1224 ft. super. clay walls . . . . .	10	4	0			
216 ft. super. 1½ brick . . . . .	7	4	0			
96 ft. super. ½ brick on edge partition . . . . .	1	0	0			
Step to pantry . . . . .	0	2	0			
20 ft. run of 8-in., 20 ft. of 7-in., 24 ft. of 6-in. flue, 3-in. air pipes . . . . .	1	8	0			
				20	12	0
434 ft. super. asphalt roof, &c., as before . . . . .	5	8	6			
97 ft. run of metal gutter, 14 ft. pipe and shoe . . . . .	1	18	0			
				7	6	6
289 ft. super. concrete floor . . . . .	1	4	9			
280 ft. super. plaster ditto, joists pale drawn . . . . .	3	10	0			
23½ yards of lath, lay and set ceilings . . . . .	1	7	5			
155 yards of lime white . . . . .	0	19	6			
6 cement weathered sills . . . . .	0	3	3			
				7	4	11
1 window frame of 3 casements, as before . . . . .	1	10	0			
5 ditto 2 ditto ditto . . . . .	5	0	0			
1 inch ledge door and frame ditto . . . . .	1	0	0			
6 ¾-inch ditto ditto ditto . . . . .	3	12	0			
2 ¾-inch ditto for pantry, &c. . . . .	1	0	0			
Stairs complete . . . . .	1	10	0			
4 shelves to chimneys, 6s., 40 ft. of 1-inch shelves, 10s., 20 ft. 3 × 1 bond, 1s. 8d. . . . .	0	17	8			
2 rough porches . . . . .	1	4	0			
				15	13	8
				50	17	1
	50	17	1			
If concrete or compressed earth walls, add . . . . .	5	2	0			
				55	19	1
				50	17	1
Stone pebble with brick quoins, add . . . . .	7	11	0			
				58	8	1
				50	17	1
9-inch brick walls, built hollow, add . . . . .	15	6	0			
				66	3	1
				50	17	1
9-inch ditto built solid, add . . . . .	20	8	0			
				71	5	1



If pantiles to roof, add 18s. 1d.; plain tiles, 1l. 16s. 2d.; slates 3l. 12s. 4d.; thatch, 1l. 16s. 2d. If pantile or slate, add 12s. for metal valleys.  
Fittings as before, 6l. 17s. 6d.

### CHIMNEY.

CHIMNEY, noun substantive (*Cheminée*, French):—derived from the Latin *Caminus*.

"1. The passage through which the smoke ascends from the fire in the house. 2. The turret raised above the roof of the house, for conveyance of the smoke. 3. The fire-place."—*Dr. S. Johnson*.

"*Chimneys* with scorn rejecting smoke."—*Swift*.

"The night has been unruly; where we lay,  
Our *chimneys* were blown down."

*Shakespeare.*

"The *chimney*  
Is south the chamber; and the chimney piece,  
Chaste Diana bathing."

*Shakespeare.*

"The fire which the Chaldeans worshipped for a god, is crept into every man's *chimney*."—*Raleigh's History*.

"Low offices, which some neighbours hardly think it worth stirring from their *chimney* side to obtain."—*Swift on Law Test*.

"A smoky *chimney* and a scolding wife,  
Are two of the greatest plagues in life."

*Old Proverb.*

Chimney, that part of a building wherein the fire is contained, and through which the smoke passes away.

The chimney generally consists of an opening in, and through a wall, upwards, beginning at the floor on one side of an apartment, and ascending within the thickness of the wall, till it comes in contact with the atmosphere, above the roof of the building.

The parts of a chimney are named as follows:—the

opening facing the room is termed the *fireplace*, the space under the fireplace is called the *hearth*, that on the same level before the fireplace is called the *slab*, to inclose this by a stone rim six inches high is desirable in Labourers' cottages.

The sides of the chimney opening are called the *jaumbs*, the head or underside of the opening is called the *mantel*, the hollow above the fireplace is called the *funnel*, and as it contracts is called the *gathering of the wings*, the space above is called the *flue*, the space between the gathering and the flue is the *throat*, the wall over chimney opening fronting the room is called the chimney *breast*, the partition between two flues is called *withs*, a collection of chimneys is called a *stack of chimneys*, above the roof *chimney shaft*, upper part of said shaft the *chimney top*.

When the parallel sides of the jaumbs are faced with stone or metal, so as to form four obtuse angles, viz., two internally with the back, and two externally with the breast or side of the apartment, making the horizontal dimension of the outside of the fireplace of greater extension than that of the back, the facings are called *covings*.

The covings are in general placed at an angle of 135 degrees with the back or breast, and should be made to form an abrupt plane on their top, so as to break the current of a sudden gust of wind.

Perhaps no part of the interior fittings of a house is more associated with ideas of cheerfulness and domestic comfort than the *fireplace*. Our abundant supply of coal has probably induced Englishmen to prefer the cheerful fire and the "comfortable *fireside*," to any other mode of heating the interior of houses.

A chimney which smokes at the wrong end is a great nuisance, a cause of discomfort, vexation, and annoyance to all who are forced to live near it; and it is not surprising that very many attempts have been made to find a remedy. We have what are called, windguards, reverberators, and all sorts and shapes of chimney pots, to the great disfigurement of our houses, but these are merely expedients which might be avoided; the best way to prevent a chimney smoking at the wrong end, is to build it properly at first.

A correspondent of the "Builder," says,—“I have built many *chimneys* in all possible situations, and have found one simple plan everywhere succeed, the secret being only to construct the throat of the chimney, or the part of it just above the fireplace, so small that a man or boy can scarcely pass through. Immediately above this, *the chimney shaft should be enlarged to double its width*, like a purse, to the extent of about three feet in height, and then diminish to its usual proportions.”

The great cause of smoky *chimneys* is, they are made too wide at their lower end, where they come down and meet the fire-place; for years it has been the practice to leave an opening the whole width and depth of the fireplace, from which the smoke rushes out and half blinds or stifles those who are sitting by the fire. How often do we see a board, or a strip of tin, or a narrow curtain under the mantelpiece; these makeshifts are called blowers, to keep the smoke from being troublesome. But besides this annoyance, these wide-mouthed *chimneys* waste more than half the heat of the fire, for, instead of coming out and warming the room, as it ought to do, the heat makes at once up the chimney, and so is lost.

Count Rumford introduced a great alteration by the introduction of stoves. From his suggestions these were named after him, and called Rumford stoves. The late Lord Palmerston was the first to patronise the Count by the introduction of these stoves in his town residence.

Although a large open fireplace helps in keeping a room ventilated, it is further objectionable because of the draught which it creates. In old-fashioned houses people are obliged to use screens and many other contrivances to shelter themselves from the currents of air which come from all parts, to give stiff-necks, ear-aches, and other unwelcome twinges to those who sit near the great cavern called a fireplace, where they are scorched on one side and frozen on the other. With such arrangements, a room never can be warm, because the air rushes away so fast that the walls never have time to get heated, and at a distance from the fire are as cold as out of doors.

A good deal of the inconvenience of smoke might be avoided by the proper management of the fire. Count Rumford observes :—" Nothing can be more perfectly void of *common sense*, and *wasteful* and *slovenly* at the same time, than the manner in which chimney fires, and particularly where coals are burned, are commonly managed by servants and others.

" They throw on a load of coals at once, through which the flame is hours in making its way, and frequently it is not without much trouble that the fire is prevented from going quite out. During this time no heat is communicated to the room, and what is still worse, the throat of the chimney is occupied merely by a heavy dense vapour, not possessed of any considerable degree of heat, and consequently not

having much elasticity. The current of warm air from the room which presses into the chimney, crosses upon the current of heavy smoke which rises slowly from the fire, obstructs it in its ascent, and beats it back into the room; hence it is that chimneys so often smoke when too large a quantity of fresh coals is put upon the fire. In short, a fire should never be *smothered*; and when proper attention is paid to the quantity of coals put on, there will be very little use for the *poker*, and this fact will contribute very much to cleanliness, and to the preservation of furniture."

Air being constantly required to feed the fire, and to supply the chimney, by external means independent of the fresh air which enters by the crevices and defects in the doors, windows, floors, etc., is often felt more injuriously as a cold current. "There is nothing more dangerous to health" than to sit near such inlets, as is proved by the rheumatisms, stiff-necks, and catarrhs, not to mention more serious diseases, which so frequently follow such exposure.

There is an old Spanish proverb thus translated:

**"If cold wind reach you through a hole,  
Go make your will and mind your soul."**

Smoky chimneys are frequently occasioned by situation of doors in a room, the grate being placed too low or the mantel too high. There are many cases in which it is not easy to discover the cause, but if once known it may be easily removed.

Flues with circular sections are, with some reason, supposed to be more favourable for the venting of smoke, than those whose sections are square and rectangular.

The tops of flues should not have such wide apertures as to permit a great quantity of air to rush down the chimney and counteract the force of the ascending rarefied stream.

There is much difference of opinion as to the origin of chimneys. They do not seem to have been in use among the Classics, as they are not found, as Winkelmann informs us, amongst the ruins of Herculaneum, although coals have been discovered in some of the rooms, from which he conjectures that the Romans used charcoal fires; Mr. Lysons, however, describes a fire-place, which he found in one of the rooms of the Roman villa at Bignor, in Sussex. There does not seem to be any evidence of the use of chimneys in England before the twelfth century, when we meet with them in the castles of Rochester, Hedingham, &c., also in a Norman house at Winwall in Norfolk; in these cases, however, the flue is carried up only a short distance in the thickness of the wall, and is then turned out at the back, the apertures being small oblong holes. Shortly afterwards we meet with flues carried up the whole height of the wall, as at the castles of Conisborough, Newcastle, Sherbourne, &c. as also at Christchurch, Hants.

At this period the shafts were carried up to a considerable height, and are generally circular; in after times the forms varied considerably, and terminated frequently with a spire, pinnacle, or gable with apertures of ornamental forms in the sides underneath for the escape of the smoke. During the fourteenth century the shafts were very short, and of great variety of forms. In the fifteenth century, the shafts were more usually octangular, sometimes square with the aperture at the top; at the latter end of this century we find clustered shafts, which afterwards became so common in Elizabethan

buildings. These clustered chimneys are most frequently of brick, variously and elaborately ornamented all the way up the shaft, and indeed form a very prominent and beautiful feature in buildings of this period.

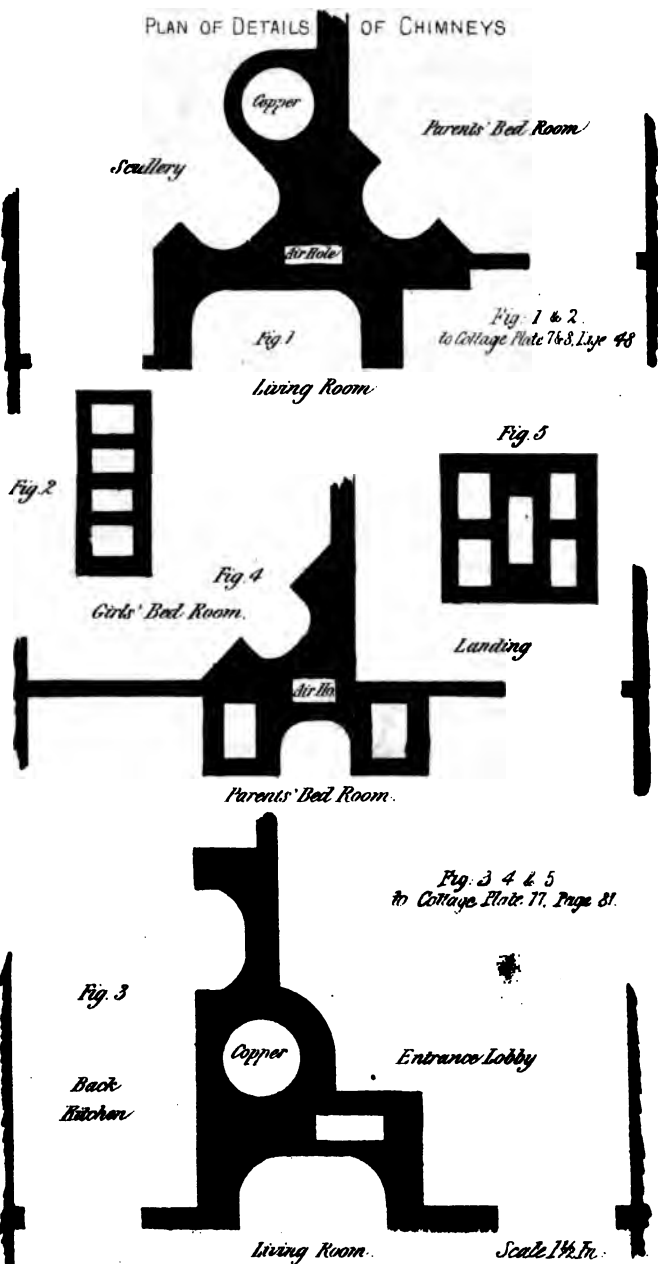
Fine specimens of this kind are to be seen at Hampton Court Palace, Eton College, East Basham, and Wolterton, Halls, Norfolk (finest examples in the kingdom), and all the larger buildings of the Elizabethan style; examples in stone, though more rare, exist at Bodiam castle, Sussex, and in houses at South Petherton and Lambrook, Somersetshire.

**PLATE XXII.**—Plan of Chimneys to Cottage Plates VII. and VIII., also to Cottage Plate XVII.

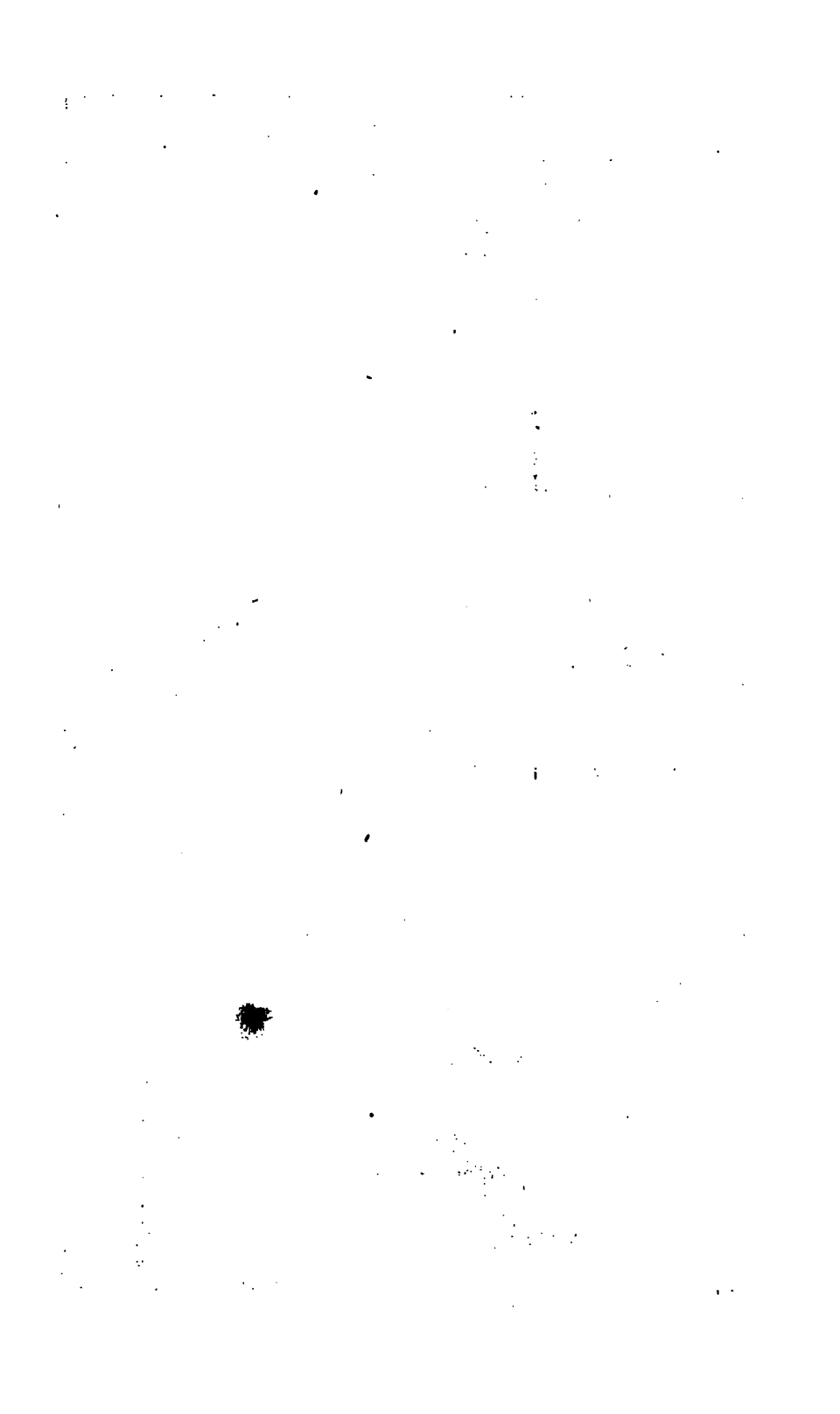
“A cheerful and steady fire is so great a comfort as to make it worth while to take some pains to attain that object. The plan here described, if properly carried out, cannot fail of success, and will leave little need for chimney-pots or cowls.

Fig. 1. Plan of chimney openings (to Cottage Plates VII. and VIII.) to living-room, scullery, and bed-room. The flue from boiler discharges itself in scullery flue 3. Stoneware pipe brings in external air to the air-flue at back of kitchen range, also to apertures above the stoves to create a draught to each chimney; the air-flue is continued to top of chimney-stack, the top covered in. An air-grate is placed directly under projecting course at the top of chimney for the escape of the vitiated air. In the space between the ceiling and the roof, as near the top of roof as possible, air-grate to be placed to communicate with air-

## PLAN OF DETAILS OF CHIMNEYS







flue. Fix perforated sliding panels to the ceilings of each room. Thus all the rooms will be ventilated by the common use of the door or the very slight opening of the sliding casement.

Fig. 2 shows the plan of flues above the roof. The flue being brought into the plan will allow the shaft to be nearly in the centre of the roof, or it could be carried to form a square shaft instead of oblong.

Figs. 3, 4, and 5. Details of plans of chimneys to Cottage Plate XVII.

The space at back of living-room stove will provide a supply of warm air, for the use of the entrance lobby, admitted through a moveable grating, to be shut off at pleasure. Ventilating shaft and draught-pipe flues as above.

The most efficient method of supplying fresh air to an apartment is by means of special channels led from the open air to a chamber behind the fire-place. This is easily carried out, and the supply of air controlled. One great advantage is, that the air is warmed in winter time.

Having provided means for the admission of pure air to the interior of rooms, the method of withdrawing it as fast as it becomes vitiated is next to be considered. The simplest plan, and easily carried out, is to take advantage of the chimney flue (unless a ventilating flue is in the stack). To prevent the smoke being passed through this into the room, a valve, such as Arnott's Balance Valve, **must** be used. These and similar contrivances are liable to get out of order; as such, the ventilating flue is always best. The heat of the chimney is communicated to the air in the flue near it; and if the air in the room is admitted to this smaller flue, the upward current created will carry off the

vitiated air from the room, that is if the communications required are made in a proper place and way.

PLATE XXIII.—Plan, elevation and section of *nécessaire*, manure-tank, ash-pit, watering-place, and pig-stye. The value and uses of the same are described at page 10.

Estimated cost from £7 10s.

This most necessary appendage to all “Agricultural Labourers’ Cottages” should be placed at some distance—say, at least thirty feet from the house. The entrance to the *nécessaire*, screened by a piece of wattle work formed by a few young saplings, about three inches diameter, rammed firmly in the ground, standing out seven feet, three feet distant from the building, interwoven with twigs. A root or two of Irish ivy, or any other evergreen, will soon cover it, so as to form a pretty object in the garden. Should the aspect be good, hives could be placed, thus making the front an apiary. We believe there is a kind of ivy, when in blossom, the bees are partial too. An alder tree planted in its vicinity is also good—its odour beneficial to the pig.

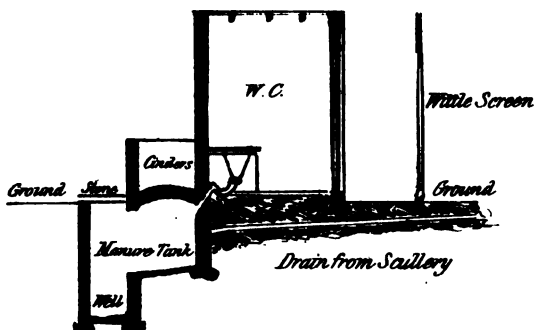
#### *A few words on Water.*

WATER, noun substantive; (waster, Dutch; wæter, Saxon):

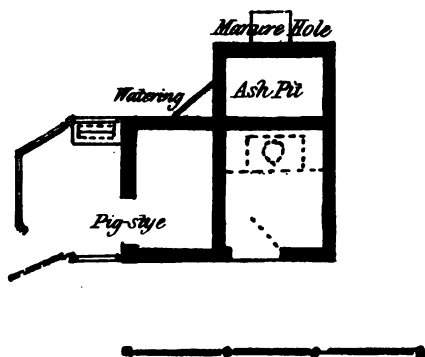
“Sir Isaac Newton defines *water*, when pure, to be a very fluid salt, volatile and void of all flavour or taste, and it seems to consist of small, smooth, hard, porous, spherical particles, of equal diameters, and of equal specific gravities, as Dr. Cheyne observes; and also that there are between them spaces so large, and ranged in such a manner, as to be pervious on all sides. Their smoothness accounts for their sliding easily over one another’s surfaces, their sphericity keeps them also from touching one



*Elevation of Pigstye, W.C. &c.*

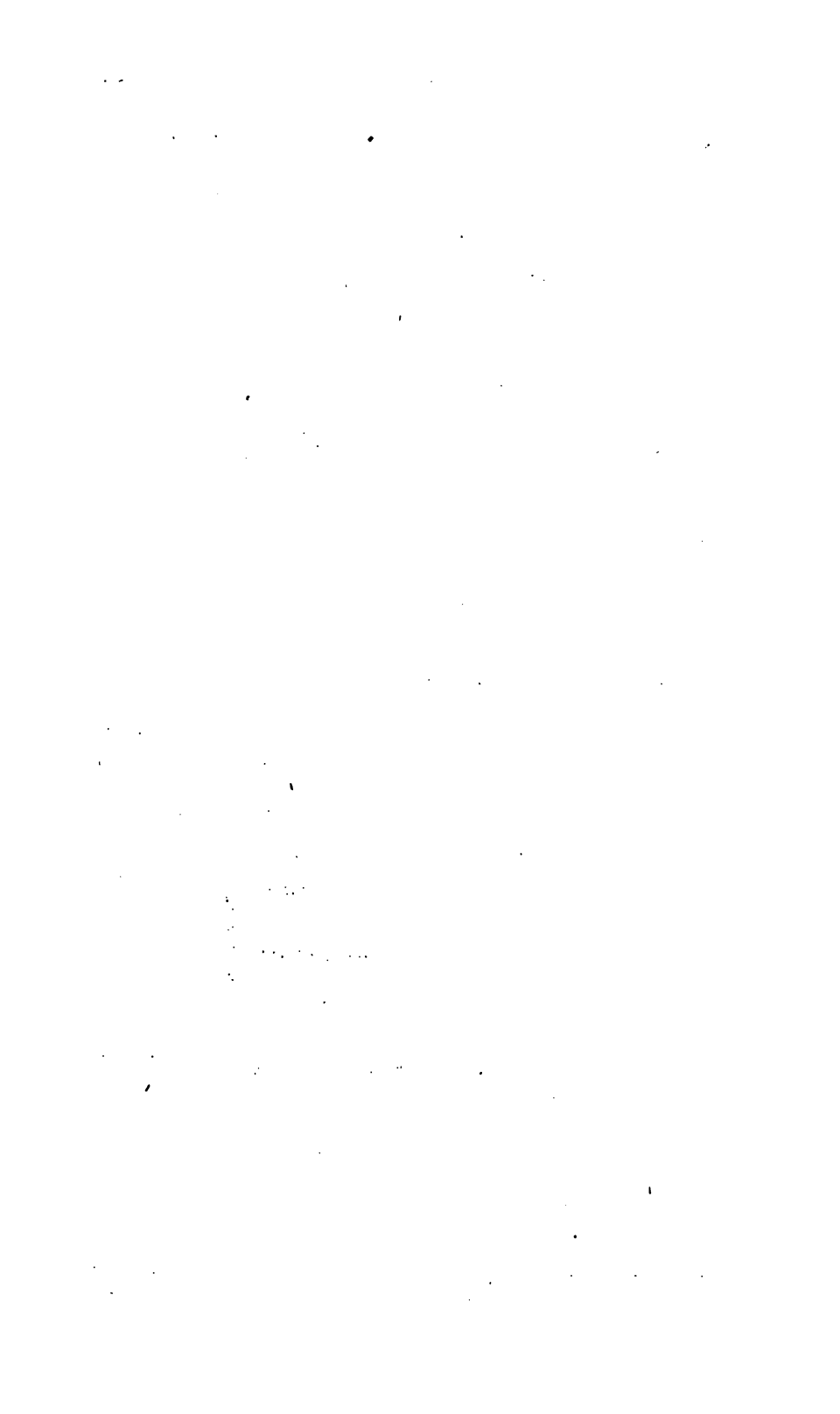


*Section Manure Tank W.C. &c.*



Cost from £7.10.0

Scale 1/16"



another on more points than one ; and by both these their friction in sliding over one another is rendered the least possible.

"Their hardness accounts for the impressibility of water when it is free from the intermixture of air. The porosity of *water* is so very great, that there is at least forty times as much space as matter in it; for *water* is nineteen times specifically lighter than gold, and consequently rarer in the same proportion."—*Quincy*.

"Those healths will make thee and thy state look ill, Timon ; here's that which is too weak to be a sinner, honest *water*, which ne'er left man in the mire."—*Shakespeare's Timon*.

"*Water* is the chief ingredient in all the animal fluids and solids, for a dry bone, distilled, affords a great quantity of insipid *water*, therefore *water* appears to be a proper drink for every animal."—*Dr. Arbuthnot*.

"He draws towards him the mist from the *waters*,  
Which pour down as rain, and form their vapours,  
Afterwards the clouds spread them out,  
They fall as drops on the crowds of men."

*Job, xxxvi. vv. 27, 28.*

"He charges the night with damp vapours,  
He drives before Him the thunder-bearing cloud;  
It is driven to one side or the other by His command.  
To execute all that He ordains  
On the face of the universe ;  
Whether it be to punish His creatures,  
Or to make thereof a proof of His mercy."

*Job, xxxvii. vv. 11—13.*

"Who hath gathered the wind in his fist ? Who hath bound the *water* in a garment ? Who hath established all the ends of the earth ? What is his name, and what is his Son's name, if thou canst tell ?"—*Proverbs, xxx. v. 4.*

To the health *water* is nearly of the same importance as the air we breathe ; for domestic use, invaluable ; to those few possessing mind with moral courage, as a drink, is a prolific source of *health* and *wealth*.

It is most essential to clearly ascertain from whence the *water* has its source, as some springs are detrimental, by its hardness, for culinary or domestic use, and pernicious, as a

drink, particularly so in chalk districts. It is stated the most celebrated school in England, for the operation of the stone, is the Public Hospital at Norwich, arising from the *water* from a chalk strata. The water from many streams are thus bad, unless previously boiled and filtered.

It is very desirable good *water* should be within proximity to all cottages, near a running stream, or overflowing pond, or by well, where it can be found at a moderate depth. Where a serious impediment arises in getting good *water*, recourse must be had, by the formation of a tank, to receive the rainfall from the house. This will be found quite sufficient, except in a very dry season. See page 11.

We have in the foregoing designs provided light with adequate ventilation. The next important thing is, that the occupants should keep the rooms *clean*. The want of this renders many a cottage little better than a *pigstye*. Whence arises the difference between adjoining cottages, both possessing the same accommodation, with similar arrangements, and spanned by the same roof. In the one you at once perceive *order and cleanliness*; in the other, *dirt and disorder* have full sway; as the wise saying, "*a place for everything, and everything in its place*," if ever taught to its inmates, has had no more effect on them than the kindred precept, "*Cleanliness is next to Godliness*." In how many cases does the health, the happiness, the character of the working man gradually sink from neglect of his own interest and well-being?

Whence arises this noxious smell which contaminates the atmosphere of so many cottages, even where there is good ventilation, but from the *filth* in the corners and crevices of the house.

The want of personal cleanliness, and the dirty condition of a large proportion of the cottages of the labourer, is one of the greatest barriers to their improvement. Neglect of *personal cleanliness* leads to neglect of *household cleanliness*, and that undermines *domestic comfort*. As a rule the floors and stairs of your cottage should be swept daily, and cleaned at least once a week; the walls and ceilings whitened once a year; chimneys in use swept once in six months; windows frequently cleaned, and do not allow a broken window to be patched with paper. Avoid all accumulation of *filth* in the sink. Ashes to be deposited in the dust-bin away from the house. *Nécessaire* to be kept clean. Hanging damp linen in living or bed-rooms is very bad.

We are indebted to the evidence of an Inspector for the following as worthy of imitation:—"One marked and favourable peculiarity, even amongst the poorest Norwich weavers, is their strict attention to *cleanliness* and *decency* in their dwellings—a token of self-respect, and a proof of ideas and habits, of which the severest privations in food and dress did not seem to be able to deprive them.

"Their rooms might be destitute of almost all the necessary articles of furniture, but the few that remained were *clean*, the walls and staircases whitewashed, the floors carefully swept, and washed and sanded, the court or alley cleared of everything offensive, the children wearing shoes and stockings, however sorry in kind, and the clothes not ragged, however incongruously patched and darned.

"' *Cleanliness and Propriety*,' said one man, 'are, in spite of our poverty, the *pride* of Norwich people, who would have nothing to say to *dirty* neighbours.' This laudable peculiarity is not confined to the county town, but is manifest



also in the cottages of the Norfolk peasantry, many of whom, though in the receipt of wages not exceeding eight or ten shillings, add to scrupulous *cleanliness* a degree of *taste*, which is manifested by the table coverlet, the chair back net, the quilt to bed, and the chimney ornament."

In contrast, the Rev. Ch. Hensley says of Gainsborough: "*Smoking* is very general among the women, and *opium-eating* prevails very commonly amongst the poor; both these habits foster *idleness*, and in consequence their houses are not kept *clean and tidy*. The men find nothing but discomfort on returning from work, and resort to the *public-house*, and the extent of *drunkenness* may be partly attributed to that.

"The frightful extent to which the homes of the working classes, instead of being abodes of *peace, joy, and happiness*, are the very reverse, through either their own *misconduct, improvidence, or neglect*.

"The guiding rule of conduct should be the Word of God, which alone gives *security* for the enjoyment of a truly and permanently *happy home*, whilst a disregard for its sacred precepts are nowhere more obvious than in the home of the *drunkard, the spendthrift, and the sensualist*, of those whose vicious habits have rendered them insensible to *dirt and wretchedness*.

"Tobacco, useful in moderation as a solace to man above sixty years of age, *although not necessary*; highly pernicious, with no redeeming virtue, when used by those beneath that age; when *youths* are allowed its use in the country, throws discredit on the *manhood* of the neighbourhood."

The evils resulting to youth is manifest by their appear-

ance when arrived at adolescence, their want of strength and energy of mind, shows its pernicious effect.

It is a great misfortune that its use by the upper ten thousand should have been so much followed up by the middle class, so that it is becoming almost universal.

We have seen some hundreds of fathers in the above classes, applaud and consider it manly in their progeny imitating themselves by the use of the weed, forgetting its tendencies to create *fast* and not *useful* men, producing *idleness*, with a craving for *drink*, and one step on to *immoral pursuits* and *low desires*.

Let us observe its working in the "Home" of an agricultural labourer; use has made it to him almost a part and parcel of his very being, a luxury of the highest kind. Speak to him of its folly, "*Lor, zur, I'd rayther have it before the best meal you could place before me,*" shows at once the opium character of the weed, with *knowledge so limited, education or forethought* to him is *unknown*; he *revels* in the *luxury*, blind to the *deterioration* of both *intellect* and *strength*, blocking up the avenue to the "*Road to wealth,*" as the pence for this *pernicious* weed would provide the *nest egg* for the *Savings Bank*.

*Sobriety*, patient and unwearied industry, with great frugality, will, especially if practised in early life, generally enable a healthy labourer to accumulate *something*. When once the *nest-egg* is laid, the commencement of property takes place, every month or week adds a little to the stock where great *Industry* prevails.

*Diligence* and *Honesty* may operate in another way, by recommending the possessor to the notice of his Landlord or Employer, who, if he is a good and generous man, may

advance what may be necessary to *set him up*, while the *sloven* and *idler* will never obtain credit.

Putting a small sum monthly or weekly into a *Savings Bank*, for which there is *Government security* is one of the most certain modes of creating Capital; if every spare shilling, instead of being spent in *Tobacco*, or *Drink*, or idle pastime, were placed at interest, a very few years' thrift would raise a considerable increase; sixpences and shillings are generally spent unprofitably, even by those who would carefully hoard up a sovereign, but sovereigns are made from sixpences and shillings, and the object and use of a *Savings Bank* is to take care of your trifling sums until they become one large one; for instance, *two shillings* saved every week will, without interest, amount in twenty years to *one hundred and twenty-four pounds, twelve shillings*; but with the interest of *only four in the hundred* it will amount to *one hundred and fifty-seven pounds* in the same time. *Two shillings* a week in five years comes to *twenty-eight pounds, three shillings, and three pence*. *One shilling* a week in seven years comes to *twenty pounds, one shilling, and eight pence*. Well may old Richard say,—

“ A penny saved is twopence clear,  
A pin a day is a groat a year.”

Let every labourer think of the advantages which this plan affords to him, in the “*Savings Bank*,” and to avoid, by bringing into force the *moral courage* implanted in the minds of all, the indulgence in a weed, which imperceptibly leads its votaries to *idleness* and *sin*.

“Military France” has a common saying as trite as a

*proverb*,—"Every French soldier carries in his knapsack the *bâton* of a *Field-Marshal*,"—thus engendering in her people the thirst for *vain glory*, with its concomitant evils of *vice* in its most hideous deformity; thus continuing in full force the true sarcasm of *Voltaire* on the people of France, who, professing to be the most enlightened in the world, are at this present the most abased, having no free press to hold in check the cruel ambition of one *man*.

"Commercial England" says to her people, you carry in your *heads*, with *perseverance* and *industry*, the *apron* of an *Archbishop*, the *wig* of a *Lord Chancellor*, the *Presidentship* of the *Royal Academy* and other societies, the *seals* of a *Prime Minister*, and the *wealth* of a *Millionnaire* as a *Commercial man*, and above all, at all times, a true voice genial to the ears of the Sovereign.

Contrast "Military France" with "Commercial England": in one "Glory," in the true estimate of the word, as enunciated by the "Divine Being," the other a "Vain delusion and a snare."

FINIS.

I.

*Preparing for the Press by the Author,*

**DESIGNS FOR FARMSTEADS**, suitable to occupiers of from Five to One Hundred Acres ; with Plans, Elevations, Sections, and Detail Drawings of all that is requisite to elucidate simply, showing, by their judicious arrangement, the great advantages to be derived from Stall-feeding in preference to Pasture-feeding ; with the great and extraordinary value to the small farmer derived from Manure Tanks by its contents being distributed on the land, showing its great productive powers, by practical observation garnered from many sources in Great Britain, Belgium, and Holland.

It will be his humble endeavour to make it a text-book for general reference to all small farmers. 50 Plates, price 5s.

Names of Subscribers will be gladly received, and practical information will be thankfully acknowledged.

II.

*Shortly will be published,*

**HINTS ON THE ADVANTAGES, SOCIAL AND MORAL**, BY THE ESTABLISHMENT OF VILLAGE DISPENSARIES, with a "LYING-IN ROOM." Showing by designs their ready adaptation in most localities at a moderate cost, and their great value to the "Country Medical Practitioner," by combining in their arrangement the use of "Warm Baths," and, more particularly for "rheumatic affections," the "Turkish Bath."

Also attached, under the Superintending Matron, should be a Public Washing-Room and Laundry, with "Infant School."

The "Social and Moral Good" their establishment would create is really more than equal to the value of "Healthy Moral Homes."

The aid of the Village Clergy is requested by sending their opinions, and if they choose, their names as subscribers. Price of Book, 3s. 18 Plates.

C. V. BERNARD, 2, Lucas Place, Commercial Road East, London.

**OLD LONDON.** "Fac-simile" of a Set of Drawings, showing the Fortifications round London, as directed to be done by the Parliament in 1643. See *Builder*, June 30, 1860. 20 Plates, 2l. 11s. 6d.

Interesting Collections of Views and Portraits illustrating the Parishes of London, Westminster, and Southwark, are formed at a moderate cost.

Valuable and interesting Views, Portraits, and Cuttings from Old Books and Newspapers, to illustrate the various Counties of Great Britain, and their respective local Cathedral Cities, Towns, and Villages.

Collectors desirous to illustrate the Biography of distinguished persons or the Topography of any Town, can be supplied with Lists of Views and Portraits.

Antiquaries and Archæologists desirous of possessing interesting collections of Fonts, Pulpits, Monuments, Churches, Cathedrals, Manor Houses, Castles, &c., cut out from various books, can be provided from 2s. per dozen.

Fonts, Churches, Schools, with public buildings, such as Town Halls, Museums, Hospitals, Alms Houses, Market Houses, Bridges, Fountains, Baths, and Wash Houses, suitable for Architects and Builders. A Collection of 100, 20s.

CHARLES EDWARD THOMPSON, 2, Lucas Place, Commercial Road East.



**LIGHT, CHEAP, AND DURABLE ROOFING,**

AS ADOPTED VERY LARGELY BY

**HER MAJESTY'S GOVERNMENT.**

**CROGGON & CO.,**

**2, DOWGATE HILL, LONDON, and 2, GOREE PIAZZA, LIVERPOOL,**

**BEG TO CALL THE ATTENTION OF NOBLEMEN, GENTLEMEN, THE TRADE AND THE PUBLIC, TO THEIR**

**PATENT**

**ASPHALTE FELT  
FOR ROOFING.**

**PATRONISED BY**

**HER MAJESTY'S WOODS AND FORESTS,  
THE ORDINANCE DEPARTMENT,  
THE ROYAL AGRICULTURAL SOCIETY OF  
ENGLAND,  
THE LEEDS AND MANCHESTER,  
THE LONDON AND NORTH WESTERN,  
THE LIVERPOOL AND MANCHESTER,  
THE CHESTER AND HOLYHEAD,  
THE NORFOLK AND OTHER RAILWAYS,**

**THE CORPORATION OF THE CITY OF EDIN-  
BURGH,  
THE DUKE OF BUCKLEIGH,  
THE MARQUESS OF ANGLESEA,  
THE MARQUESS OF WESTMINSTER,  
THE BIRKENHEAD DOCK COMPANY,  
THE DOCK TRUSTEES OF LIVERPOOL,  
MOST OF THE NOBILITY, GENTRY, AND  
AGRICULTURISTS,**

**And many Members of the Royal Agricultural Societies of England, Scotland, and Ireland.**

*The price of the Felt is only **ONE PENNY** per Square Foot, manufactured to any length required, by **32 inches** wide.*

The late Mr. Loudon considered for Roof Coverings this prepared Paper or *Asphalted Felt*, when properly payed over with Furnace Dust or Sand, was the best article for that purpose, and no other equal to keeping out the **Heat and Cold**.

The **FELT** has been extensively used and pronounced efficient, and particularly applicable for warm climates.

- 1.—It is a non-conductor.
- 2.—It is portable, being packed in rolls, and not liable to damage in carriage.
- 3.—It effects a saving of half the Timber usually required.
- 4.—It can be easily applied by any unpractised person.
- 5.—From its lightness, weighing only 42 lbs. to the square of 100 feet, the cost of carriage is small.

Under Slates in Church or other Roofs the Felt has been extensively used to regulate the Temperature.

**INODOROUS FELT,**

**FOR DAMP WALLS AND FOR DAMP FLOORS, UNDER CARPETS AND FLOOR CLOTHS; ALSO**

**FOR LINING IRON HOUSES,**

**PRICE—ONE PENNY PER SQUARE FOOT.**

**CROGGON & CO.'S PATENT FELTED SHEATHING,** for Covering Ships' Bottoms, &c., and **DRY HAIR FELT,** for Covering Steam Boilers, Pipes, &c., preventing the radiation of Heat, and Saving 25 per Cent. of Fuel.

Samples, Testimonials, and full instructions, on application to

**CROGGON & CO., 2, DOWGATE HILL, LONDON,  
AND AT 2, GOREE PIAZZA, LIVERPOOL.**



## RANSOMES & SIMS, IPSWICH,

Continue to give their best attention to the Manufacture of the most Modern and Improved Agricultural Machinery, including Patent and other Ploughs, suitable for every soil and purpose. Harrows, Cultivators, Rollers, and other Field Implements. Horse Rakes and Haymakers. Chaff Cutters, Root Cutters, Bruising and Crushing Mills, for Corn, Oilcake, &c.

Steam Engines, both Portable and Fixed, with Patent or other Boilers.  
Steam Threshing Machines, both Portable and Fixed, and Single or Double Blast. Horse-Power Threshing Machinery.

Dressing Machines, Corn Mills, Horse Gears, &c.

RANSOMES & SIMS have long been celebrated for combining in their Agricultural Machinery the utmost simplicity, durability, efficiency, and economy of repair, and their constant care is given to the maintenance of these important principles in everything which they manufacture. R. & S. employ upwards of 1000 men, and can therefore execute any order with great dispatch.

*Illustrated Catalogues, Post Free, on application to the*

**ORWELL WORKS; or to their London Agent, SHEPPARD RANSOME, 31, Essex Street, Strand, W.C.**

The usual Discount to the Trade. Foreign Orders must be accompanied by a credit in London, payable on presentation of Invoice.



Repeated APPLICATIONS (from Noblemen, Landed Proprietors, Agriculturists, Gardeners, Owners of Horticultural Buildings, as Greenhouses, Conservatories, Forcing Houses, and Rustic Buildings of every description) for *Paints* mixed in a *liquid state*, ready for use. To meet this *required want*, G. SPILL prepares from "GENUINE WHITE LEAD" or "BEST IMPROVED ZINC PAINT," with PATENT SUPERIOR REFINED LINSEED and BOILED OILS, and TURPA, in Cans from 1 to 10 Gallons each.

	Per Gal.	Sqr. Yds.		Per Gal.	Sqr. Yds.
Priming Colour . . .	6s. 0d. will cover	55	Yellow Paint . . .	6s. 0d. will cover	44
White Paint . . .	7s. 0d. "	44	Blue Color . . .	8s. 6d. "	55
Lead Color . . .	6s. 0d. "	55	Green Paint . . .	6s. 0d. "	55
Black Paint . . .	5s. 6d. "	90	Bright Emerald Green	12s. 0d. "	25
Stone Color . . .	7s. 6d. "	44	Bronze Green . . .	7s. 0d. "	60

It is clearly understood that skilled workmen are not requisite to paint common work ; by attending to the following directions, any person with steady hand and correct eye, will command success. The knots to all new work to have a thin coat of Patent Knotting. Stop up the nail-holes and all shakes before putting on second coat, and rub down the work with Pumice Stone. Lead color is the ground to finish Green upon. Glass cut to size, from 2d. per foot. Crystal Glass, 6d. Ground Glass, 4d. Colored Glass, 6d. Correct estimates are given for quantities. Patent Knotting, per pint, 1s. 6d. Putty per cwt., 8s. Pumice Stone, 3d. lb. Putty Knives, Brushes, and Tools, &c.

It is universally acknowledged, that all works exposed to the various changes of the weather, run into rapid decay, unless defended by some covering to resist the *corroding* influence of the atmosphere ; Coal and other Tar Paints are of short lived protection, being only varnishes which the summer's Sun melts, evaporating the spirit—leaving the resin ; this in winter cracks with the frost, and falls off in flakes. Great expence is incurred in this country for the erection of various buildings, fences, iron-work etc., which, if not coated, becomes dilapidated. ANTI-CORROSIVE PAINT is the best known preservative for outside work, embracing the properties of *durability, beauty and cheapness*, being one third *less cost* than the Mixed Paints. One Gallon of Chocolate, Black, or Red Anti-Corrosive Paint, will cover 50 square yards, at a cost of 4s., well adapted for Agricultural Buildings, Fences, and Implements. TORCH OIL is a material to preserve Wood in damp situations, used by Sir J. K. Brunel and other *Engineers*, 6d. per Gallon, will cover 24 square yards. Mixed Preparation, rendering Wood, in a measure, incombustible, 6d. per Gallon, will cover 24 square yards. PORTLAND CEMENT WASH prevents Greenness and Vegetation on Walls exposed to the weather ; also the Absorption of Wet, 1s. per Gallon, will cover 40 square yards. Stains for Wood, similar to those used for the *Queen* at "*Balmoral*," 6s. per Gallon, will cover 80 square yards. Varnishes of every description, from 1s. per Gallon. Stucco Paint 2s. per Gallon, will cover 36 square yards.

**Sole Agent for "GREENE'S METALLIC OXIDE PAINT,"** the only known Paint to preserve Ship's Bottoms, and to preserve IRON exposed to HEAT and MOISTURE ; also prevents Damp in Walls, 8s. per Gallon.

G. SPILL can recommend for a good artificial Light, his Pure Refined Colza Oil, at 4s. 3d. per Gallon ; also for *Lubricating*. Engine Oils at 4s. 2d. per Gallon. Cotton Waste ; Stockholm Tar ; Best Town made Glue,





